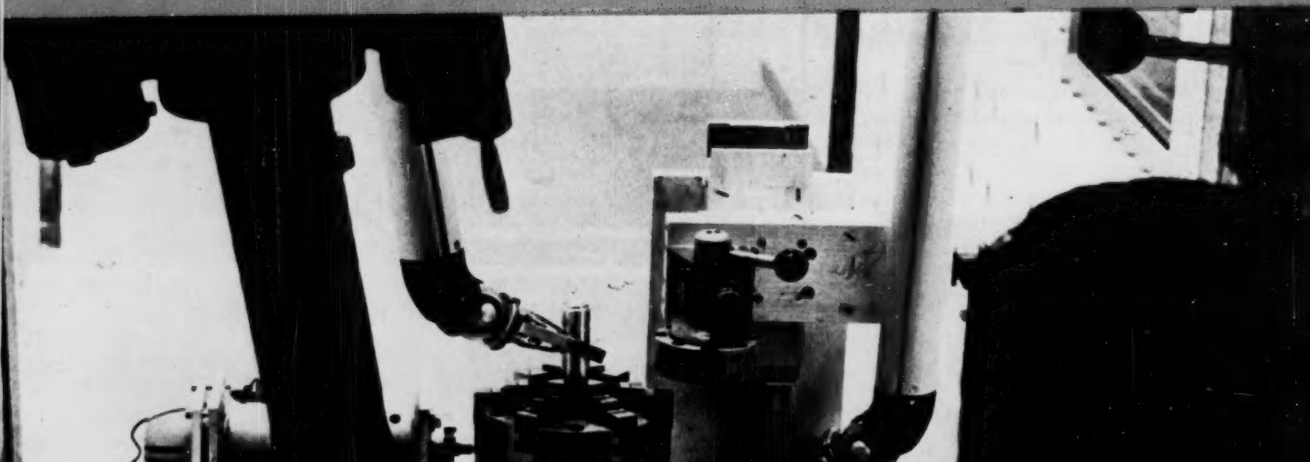
THE MAGAZINE OF

Standards



... hygienic standards for occupational health — page 69

MARCH 1959

In Two Parts — Part 1

THE MAGAZINE OF

Standards

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

VOL. 30 | MARCH, 1959 | **In Two Parts—Part 1** | No. 3

ASA

Our Cover

General Electric — Schenectady, N.Y.

Intricate mechanical "hands" place an irradiation capsule in the chuck of a remotely operated lathe in the radioactive materials laboratory at General Electric's Vallecitos Atomic Laboratory in California. Capsules will irradiate fuel elements to determine their properties under simulated reactor operating conditions. For discussion of radiation exposure as part of the general problem of workmen's health, see page 74.

ASA

Published monthly by the AMERICAN STANDARDS ASSOCIATION INCORPORATED, 70 East Forty-fifth St., New York 17, N. Y. Subscription rates: Companies in U. S. and possessions, $7.00 per year; in other countries, $8.00. Public libraries, schools, and government agencies, in U. S. and possessions, $6.00 per year; in other countries $7.00. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1879.

This publication is indexed in the Engineering Index and the Industrial Arts Index.

FEATURES

NEWS

DEPARTMENTS

. . . . marginal notes

ALTHOUGH sometimes called slow, the American Standards Association, in one case, has been 26 years ahead of the rest of the world. The history-making action, taken in 1933, was approval as American Standard of the inch-millimeter ratio, 1 inch = 25.4 millimeters, now adopted as the new International Inch (page 76).

ASA acted in 1933 on a request from the Ford Motor Company, which asked that 25.4 be approved as the American Standard inch-millimeter conversion factor for use by U. S. industries.

ASA referred the Ford request to a special committee. Names of its members will bring nostalgic memories to many who were active in standardization in the early 'thirties. C. B. Veal, Society of Automotive Engineers, was chairman. L. F. Adams, General Electric Company, later for many years chairman of ASA's Electrical Standards Board, representing the National Electrical Manufacturers' Association, was a member, as were H. W. Bearce, National Bureau of Standards, later important in ABC screw thread work; F. O. Hoagland, National Machine Tool Builders' Association (1952 winner of the Standards Medal); C. B. LePage, American Society of Mechanical Engineers; and Paul V. Miller, Gage Manufacturers' Association.

C. E. Johansson, famous maker of the Johansson gage blocks, represented the Ford Motor Company.

The committee unanimously recommended action under ASA procedure.

On this recommendation, ASA called a general conference of industrial and technical groups in October 1932. A draft of a proposed American Standard was presented by the special committee for action.

A feature of the meeting was a paper presented by Mr Johansson, published in the *ASA BULLETIN* (now *THE MAGAZINE OF STANDARDS*), January 1933. Mr Johansson presented slides and demonstrated his gage blocks to explain the significance of the action.

The proposed standard was approved by the conference. It included three conversion tables and rules for conversion practice, in addition to specifying the 25.4 ratio.

The ASA approved American Standard Inch-Millimeter Conversion for Industrial Use, B48.1-1933 on March 13, 1933.

This Month's Standards Personality

GEORGE C. PAFFENBARGER, world authority in the science of dental materials, has turned his attention to standards. Dr Paffenbarger has accepted the chairmanship of a new sectional committee that is now making plans to develop American Standard specifications, including sizes, and methods of designation, for the x-ray film used by dentists. The committee is officially known as ASA Sectional Committee on Specifications for Dental Radiographic Film, PH6, and is sponsored by the American Dental Association.

Dr Paffenbarger has spent most of his career in research and has received world-wide recognition for his contributions to dentistry. He has been research associate of the American Dental Association at the National Bureau of Standards since 1929, with the exception of five years during World War II. During those five years, the association gave him a leave of absence to serve in the Dental Corps of the United States Navy at the Naval Medical Supply Depot, Brooklyn, N. Y. There he was advanced from Lieutenant Commander to Commodore. This made him the first Reserve Dental Officer to attain flag or general rank in all of the Armed Forces. He now holds the rank of Rear Admiral in the U. S. Navy Reserve.

Dr Paffenbarger, following graduation from Ohio State University, started his career as a dentist in 1924 in association with his pioneer dentist father in the small town of McArthur, Ohio. After a year, however, he started the career that has made him world famous by leaving Ohio for Honolulu, where he served as extern at the Palama Settlement Dental Clinic. The following year he returned to Ohio as instructor in the College of Dentistry at Ohio State University. His work there led to his appointment as research associate of the American Dental Association at the National Bureau of Standards in 1929.

Dr Paffenbarger's published reports have been quoted in practically every dental journal throughout the world. In addition to his articles, he is co-author of a book on the physical properties of dental materials. He has been consultant in dental research to the United States Public Health Service, the U. S. Navy, and the U. S. Army Dental Services.

Dr Paffenbarger has been active in many national and international dental and scientific organizations. He is a Fellow of the American College of Dentists, the New York Academy of Dentistry, and the American Association for the Advancement of Science. In 1954 he was president of the International Association for Dental Research. He is a member of the Federation Dentaire Internationale as well as the American Dental Association, and holds honorary membership in the Japan Dental Association and in the American Denture Society, among others. He has just been named praelector of the Faculty of Medicine, University of St Andrews, Scotland.

Among many awards, possibly most important is the Wilmer Souder Award of the Dental Materials Group, International Association for Dental Research, which was presented to him in 1958.

Dr Paffenbarger and his wife, Rachel, have three children, George, Gretchen, and Rose Anne, all of whom have degrees in science. His hobbies are making silhouettes and farming at his home in Boyds, Maryland.

by CHARLES R. WILLIAMS

HYGIENIC STANDARDS FOR OCCUPATIONAL HEALTH

General Radio Company

NOISE is one of the industrial problems being studied by the International Congress on Occupational Health for the protection of workmen. Here, the noise level of a drill press operation is being checked with a sound-level meter.

MR WILLIAMS, assistant vice-president of Liberty Mutual Insurance Company, presented this paper on what is being done to protect workmen in industry from the effects of toxic materials, noise, and radiation, at the Twelfth International Congress on Occupational Health. Mr Williams was the U. S. representative at the Congress, which was held at Helsinki, Finland, July 1-6, 1957. As a result of his recommendations (see Conclusion, page 75), an international committee has been formed. Professor R. Truhaut, University of Paris, is chairman. Mr Williams is the U. S. member. The first meeting will be in Prague in April, 1959.

Mr Williams is representative of the National Association of Mutual Casualty Companies on the Nuclear Standards Board of ASA, as well as on the sectional committees on Safety Code for Industrial Use of X-rays and Radiation, Z54, and Allowable Concentrations of Toxic Dusts and Gases, Z37.

By special permission, this paper is published here for the first time in the U. S.

THE OPERATIONS OF MODERN INDUSTRY provide many sources of materials which may be harmful to exposed workers. There may also be health problems from excessive radiation, noise, excessive heat, or other physical agents. It would, of course, be desirable if industrial operations could be so conducted that there could be no possibility of exposure to any of these things.

In our present state of knowledge such conditions would be extremely difficult to attain. Furthermore, it has been reasonably well established that the human organism can tolerate certain minimal exposures to various foreign materials.

This is a well established principle in the field of medicine. Physicians are constantly prescribing small amounts of drugs for the treatment of human ills. Most of these would prove harmful and even fatal in larger doses. Thus in the field of pharmacology, one of the most important activities is to determine the quantities of drugs which can be used safely.

In occupational health it is equally necessary to determine levels of exposure to toxic materials and to physical agents which can be tolerated without injury by industrial workers. Obviously, such criteria should be maxima not to be exceeded, and not levels to be attained.

While the basic objectives of all those who use such standards are the same—the prevention of occupational disease—interpretations and application may vary. Many state and other governmental agencies utilize these standards as an aid in screening the large numbers of industrial operations under their jurisdiction. Others tend to apply them with force of law. In private industry they are used as engineering guides in estimating possible hazards; in evaluating the effectiveness of any control measures which may be taken; as a means of comparing toxicity of several materials and for medical control purposes. Regardless of the methods of application, such guides or standards are absolutely essential for an intelligent approach to the control of occupational disease. Inasmuch as the approach is somewhat different for toxic materials, noise, and radiation, each will be discussed separately.

Hygienic Standards for Daily Inhalation

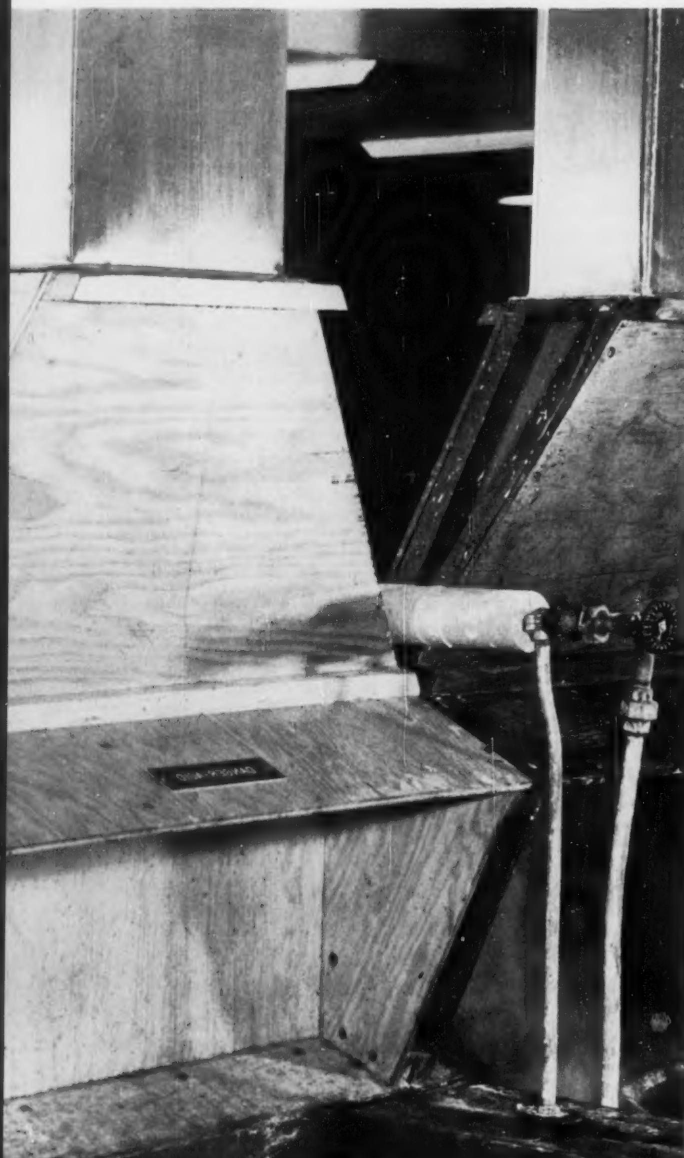
Historical—Safe levels were first proposed for specific materials by individuals publishing the results of their research. In 1941, the American Standards Association formed the Z37 committee, made up of authorities in every phase of occupational health. The scope of the project was: "To determine, establish, and promulgate the allowable concentration limits of harmful gases, vapors, fumes, dusts, and mists, and other subjects related to the allowable concentration limits of such substances to the atmosphere of working places from the viewpoint of occupational disease prevention" [1]*. This committee has released a series of individual reports on several toxic materials. These reports include the scope, properties of the substance, methods of sampling and analysis, and a bibliography. To date, there have been 15 such standards published, the last of which was issued in 1949. This group has now resumed activity and will undertake a review of some of its existing standards as well as issuing standards on additional substances.

[EDITOR'S NOTE: Committee Z37 has now completed drafts of three standards which are before the sponsor, the American Industrial Health Association, for vote on submittal to the American Standards Association. In addition, 12 others have been completed by subcommittees for consideration by the sectional committee.]

In 1943, the United States Public Health Service [2] published, in a manual, a list of standards which represented the judgment of many people as well as the experience of this organization. The first attempt to demonstrate the validity of each proposed safe level was made by Cook [3] in 1945 when he assembled a list of standards and included with the list a summary of information from the literature to support each value.

The American Conference of Governmental Industrial Hygienists published its first list of "threshold limits" in 1947 [4]. These values represented the consensus of a committee of qualified experts. They have been reviewed and brought up to date annually. Since 1950 the list has been published each year in the *Archives of Industrial Health*. The 1956 list [5] contains values for 151 gases and vapors, 54 dusts, fumes, and mists, and 13 mineral dusts. In addition, there are 33 so-called tentative values. The committee on chemical agents in its report to the Ninth Annual Conference of Industrial Health (U. S., 1949) made several suggestions in regard to the problem of threshold limits. Probably most important was the suggestion that more supporting information should be supplied with any published list of so-called safe levels. In a report to the American Industrial Hygiene Association in April 1956, Smyth [6] made several concrete suggestions. He pro-

* Numbers in brackets refer to bibliography.



VENTILATION SYSTEMS, such as the one shown in this picture, help to prevent harmful effects of toxic fumes, but the question of the maximum amount of dusts and gases that may safely remain in the air of work places is still being studied.

posed that lists of standards should contain information as to the most important physiologic effect of inhalation; the physiologic effect at threshold; the effect at twice threshold, and the effect at 10 times threshold. In addition, he suggested listing of important hazards other than inhalation effects, the nature of the supporting data, and the year the standard was proposed. Such an approach should clarify the significance and vastly increase the usefulness of such standards.

The most recent contribution is publication of the Hygienic Guide Series by the American Industrial Hygiene Association. In this series there is a sheet for each material, which includes information as to recommended maximum atmospheric concentrations; severity of hazard (both health and fire); the short exposure tolerance; atmospheric concentrations immediately hazardous to life; physical and chemical properties. Under the heading "Industrial Hygiene Practice," brief statements as to recognition, evaluation of exposure, and recommended control procedures are given. Also, under the heading "Specific Procedures" suggestions are made for first aid, prophylactic procedures, and special medical procedures, where necessary. Finally, a list of references is provided. This material is published in the *American Industrial Hygiene Association Quarterly.*

Terminology—Standards have been proposed by individuals and also by committees of authorities acting under the sponsorship of several technical organizations. As a result of this varied approach, many terms have been selected to describe the suggested values. The most common reference is to "M.A.C's." Just what does this mean? Originally, the term referred to "Maximum Allowable Concentrations." While in part it denoted legal regulation, it could also be interpreted to mean that it is perfectly acceptable to have exposures up to this level. This latter idea is contrary to the more desirable philosophy of keeping exposures not only below the standards, but as much lower as can reasonably be attained. This is true because all persons are not affected in the same way nor to the same degree by toxic materials. These differences in susceptibility vary in a random fashion. As the concentrations of a toxic material increase, the numbers of people affected also increase. Conversely, as the levels decrease, the number of affected individuals will also decrease. There may occasionally be extremely susceptible individuals who will have difficulty at levels below the standards. Thus, the lower the concentration of any toxic material the less the chance that anyone will be injured.

The American Standards Association Z37 committee which deals with these problems, proposed using the term "Maximum Acceptable Concentration" [1]. The reason was to remove the legal implication of the word "allowable" and still retain the catch phrase "M.A.C." In general, little has been gained, for to most industrial health people "M.A.C." still means "Maximum Allowable Concentration."

The American Conference of Governmental Industrial Hygienists titles its list "Threshold Limit Values."

Here again, the term "limit" implies regulation and a fine line between toxic and non-toxic. In the paragraph preceding the table of values, the committee goes to great length to point out that this is not, in fact, the case. This terminology is no more desirable than "M.A.C."

The American Industrial Hygiene Association, in September 1955, began publication of the Hygienic Guide Series. The title is in keeping with the recommendations of the Committee on Chemical Agents at the Ninth Annual Congress on Industrial Health (U. S., 1949). This terminology was recommended again in 1956 by Smyth [6] when he proposed "Hygienic Standard for Daily Inhalation." For toxic materials, the primary mode of exposure is by inhalation and all of our standards to date have referred to toxicity by this mode of entry. Because the term "Hygienic Standards" expresses most accurately the actual purpose of criteria in occupational health, without indicating a sharp line of demarcation with relation to hazard, the writer also favors its use.

Development of Standards—The development of valid standards in the field of occupational health can come about only as a result of careful, critical examination of all available pertinent information. It is a simple matter merely to publish a list of numbers and call them criteria. It is quite another matter, however, to provide standards which are meaningful because of the information, experience, and data which have been considered in their development. One cannot expect workers in the field of industrial health to accept without question a series of unsupported numbers as standards.

The accepted procedure in the United States today is to assemble groups of individuals who are qualified by training and experience to gather together and examine critically all available information relative to the toxicity of the materials being considered.

There are two basic kinds of information which are used in the establishment of hygienic standards. The first of these is data from animal experimental work; the second is industrial experience.

With newer materials, toxicological data resulting from animal experimental work provide the basis for establishing tentative criteria. Such data must, of course, be applied with caution, for it is a well-known fact that toxicological effects of various materials may be different for different species of animals. Extrapolation of such data, therefore, to humans must be done with extreme caution. Many industrial concerns, particularly those in the business of producing chemicals, do extensive toxicological testing before releasing such substances for general industrial use. These studies may consist of determination of effects of eye and skin irritants; high level toxicity and physiological effects; long-term low level studies to evaluate the chronic effect. Evaluation of the kind of damage which is done is as important, if not more so, than the levels of intake which produce these effects.

To be of value, such studies must be done under carefully controlled conditions with due consideration for variations in species of animals, sex, age, as well as possible synergistic effects. While data of this type may be far from accurate in predicting possible human effects, they do provide a good basis for interpretation by experienced toxicologists as to what, in general, may be the problems to be expected from their industrial use.

Much more useful information can be obtained from industrial experience with toxic substances. For many of the more common chemicals in industrial use today we have had many years of experience in handling them. This experience provides valuable background and basis of judgment in establishing hygienic standards.

There are two kinds of information to be derived from such experience. The most readily available and least desirable of these is related to cases of overexposure in which employees were injured. Such information is of little value in establishing safe levels, even though it does indicate concentrations at which people may be injured. The most meaningful data from industry, of course, are negative. In many industrial plants, toxic materials have been used for years without adverse effect upon the health of exposed workers. In many of these cases, the concentrations to which the workers were exposed are also known. Publication of data from such experience would be of inestimable value to those who are attempting to establish hygienic standards. It is distasteful to most scientists to devote years of study to a problem and have only negative data to publish. Distasteful as it may seem, publication of such data can serve to strengthen or if necessary to modify existing standards.

It is also difficult to convince industrial managements on the feasibility of setting up long-time studies which would involve repeated physical examinations of exposed employees and a well-planned and executed program of air analysis to provide the necessary data for such a study. Extensive programs of this kind have been carried out by at least two American companies [7, 8] and the publication of this information has emphasized the importance of such contributions in the field of occupational health.

As has already been indicated, it is not sufficient merely to publish a list of numbers indicating what are considered to be safe levels. It is equally important to know for each substance the kind of response which may be expected. The consequences of over-exposure can be much greater for some substances than for others. In the table of hygienic standards published by Smyth in 1956 [6] the author classified, on the basis of personal judgment, 238 substances, exclusive of mineral dusts, listed in the threshold limit values published by the American Conference of Governmental Industrial Hygienists in 1956. He set up nine basic categories of human response. In the case of each substance listed, he stated the most important effect of inhalation and predicted the effects of daily 8-hour inhalation at threshold and twice threshold and at ten times threshold. He also included in some cases effects

other than inhalation. The categories which he selected were chronic toxicity, acute toxicity, narcosis, irritation, asphyxiation, fume fever, eye pigmentation, cancer, and allergies. Application of standards in these various categories may differ widely. For example, in the case of acute toxicity where systemic injury may result from a single case of over-exposure it is imperative that concentrations at no time be permitted to rise above this level. For chronic toxicity, on the other hand, the values generally refer to average concentration over a working day. In this case, short-time exposure in excess of the stated limits could be tolerated as long as the average daily exposure does not exceed stated thresholds. In each case, in the establishment of hygienic standards it is essential to take into consideration the kind of injuries which may result from over-exposure either on a short-time or long-time basis.

Another problem is related to the fact that in some cases values have been established on the basis of comfort. In these cases, unfortunately, the judgment of comfort or lack of comfort has frequently been made on the responses of groups of individuals not normally inhaling such materials. It is important in such cases that the basis of the standard be clearly indicated in each table of values.

It is clear, then, that the development of hygienic standards for daily inhalation must be based upon all available data and experience. Consideration of the consequences of over-exposure are also a necessary part of such standards.

Use of Standards—The intelligent day-to-day use of such hygienic standards requires a full knowledge of their validity. This is the basic reason for the necessity of including with any list of standards all of the data discussed above. The values should be considered as guides rather than specific numbers which can be used to separate safe from unsafe conditions. Hazard involves not only the toxicity of a material but also other factors such as exposure pattern, individual susceptibility, and possible synergistic effects of multiple exposures.

In order to make proper use of these values it is essential that evaluations of the industrial environment be done carefully and thoroughly. There must be sufficient samples taken in work areas to define the problem. The analyses of these samples should be carried out by means of accepted procedures under carefully controlled conditions. In general, particularly in the case of those substances capable of producing chronic injury, the sampling must be adequate to produce values which represent average daily exposure. If the exposures are extremely variable, the frequency of peak exposure and the amount by which they may exceed this daily average should also be determined. In the introductory paragraph of the Threshold Limit Values for 1956 [5] it is stated, "Values are given in the following tabulation for the maximum average atmospheric concentration of contaminants to which workers may be exposed for an 8-hour working day without injury to health."

The application of these standards may fall into one of several categories, but, regardless of the category involved, thoroughness of evaluation is vital. As much care must be used in sampling the industrial environment as is required to establish limits and to validate them.

Perhaps the most extensive use of hygienic standards is in the field of engineering control. Here they are an aid in evaluating whether or not a hazardous condition may exist; in designing control measures for new operations; in correcting unsatisfactory plant conditions; and in routine checking of the effectiveness of ventilation systems or other control measures. In planning for new operations, including calculation of ventilation requirements, the hygienic standard, physical and chemical properties of the toxic materials, and relation to other operations must all be considered. In the case of existing operations, air sampling used in conjunction with hygienic standards can be used as a measure of effectiveness of control. Without the guidance of such hygienic standards, the engineering control of occupational disease would be largely guesswork.

Another common use of standards in the engineering field is in reducing occupational disease hazards by selection of materials. It is possible to reduce an exposure from hazardous to safe with the same equipment by changing to a less toxic material. The substitute must be able to do the job as effectively as the hazardous one and it must not increase the cost substantially. However, it is not simply a case of looking at a list of threshold values and selecting the one with the highest limit. One must know not only the standards and the physiologic effects resulting from over-exposure but also all of the physical and chemical characteristics of the materials being compared and the way in which they are to be used. The ultimate criterion is the amount of material which will be inhaled and the consequences of such inhalation.

Other uses of these standards are in the medical field. First, they may be used as an aid in pre-placement. A knowledge of the physiologic response to toxic materials enables an examining physician to select employees for specific jobs. In many cases where known exposures to toxic materials or potential exposures to such materials may exist, there are tests and examinations which can be made to assist the medical director in avoiding placing individuals who might be particularly susceptible to injury from exposure to such substances. A second important application of these data is an aid in the diagnosis of disease. There are many cases where the signs and symptoms produced by exposure to toxic materials are so similar to those of normal disease that a differential diagnosis is difficult. If the examining physician has sufficient information on the kinds of materials to which the patient may have been exposed and the concentrations of these materials, he will be greatly assisted in making a correct diagnosis.

It can be seen that in the case of hygienic standards for daily inhalation they can be a powerful force in the

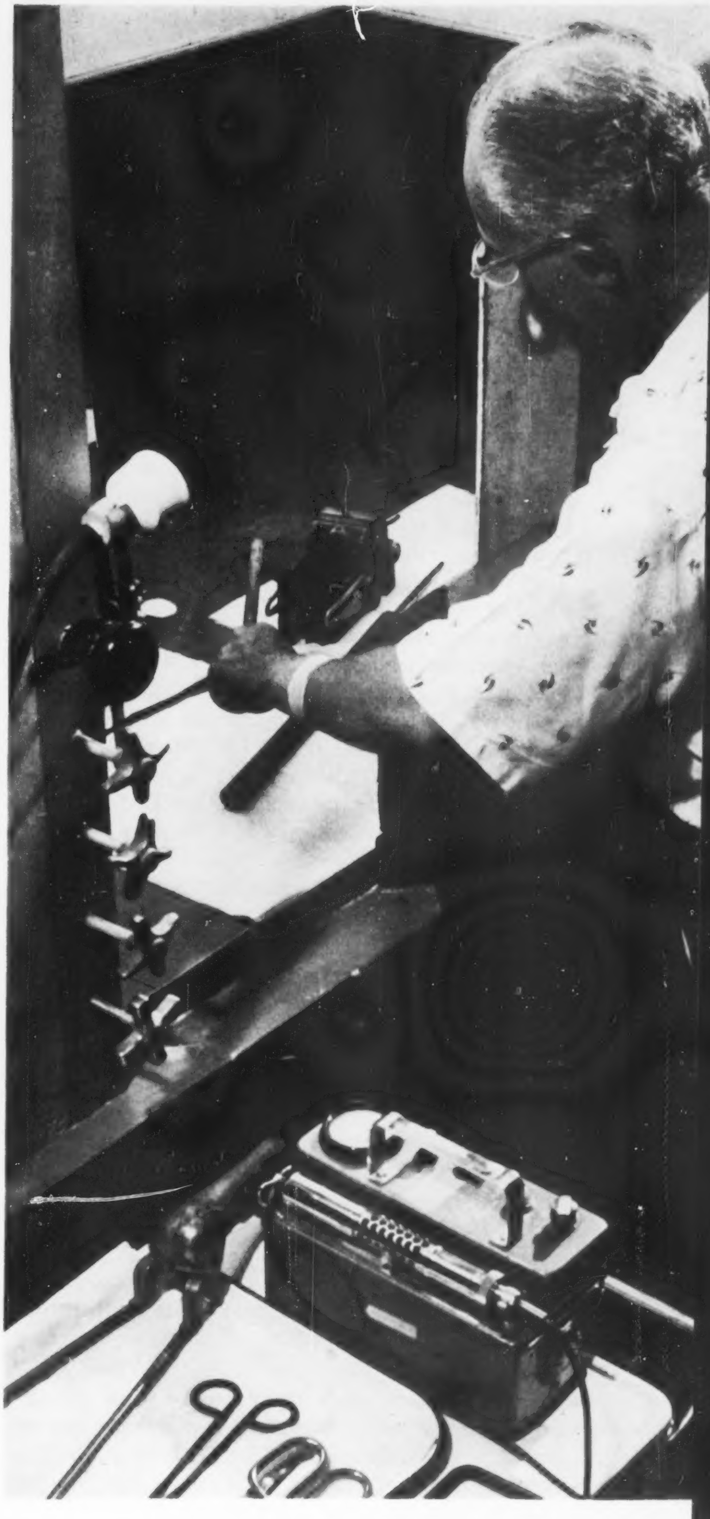
prevention of occupational disease. Their value, however, is directly in proportion to the validity of each level and the intelligence with which it is applied.

Hygienic Standards for Noise

Loss of hearing from exposure to excessive noise is a problem which has become increasingly important during the past few years. Because of this, the need for standards which can be used as a guide in evaluating the possible hazard and as an aid in developing noise control techniques has become more pressing. The investigations in this field have indicated that there are many ways in which the noise problem differs from other industrial hygiene problems. The differences have complicated considerations of standards for noise.

One of these complications is the fact that there are several kinds of effects produced by noise exposures. These include possible effects on behavior; interference with speech communication; loss of hearing; and non-otological physiologic effects. The noise levels which can produce these various reactions are quite different. For example, the standard for speech communication in an office or conference room is substantially lower than the criterion proposed for the prevention of occupational loss of hearing. Since the first concern in the occupational health field is the prevention of injury, the most important criteria are those relating to hearing loss and non-otological physiologic effects. The approach to these criteria cannot be the same as that used for toxicological problems for several reasons. First, a gradual loss of hearing may be a normal result of aging (presbycusis). This is a complication not encountered when dealing with toxic materials. Second, there are many causes of cochlear damage, both physical and chemical, which produce results that cannot be distinguished from acoustic injury by any present known method. These include the effect of drugs, head injuries, and many infectious diseases. There is an appreciable segment of the population having deviations from normal hearing resulting from many possible causes.

Efforts to find standards in this field are relatively recent. During the 1930's and 1940's, largely because of relatively crude measurement techniques, few good data were available, but some authorities ventured individual opinions as to a single number which supposedly represented a permissible noise level. Certainly these numbers completely lacked any supporting data and so were invalid. The first serious attempt to provide a substantiated damage risk criterion was made in 1950 by Kryter [9] in his classic Monograph "The Effects of Noise on Man." It was Kryter who suggested that all frequencies of the noise spectrum are not equally damaging and, therefore, any criterion must be expressed in terms not only of sound intensity but also of frequency. His suggested values were given in terms of critical bands. Following Kryter's suggestion, Beranek subsequently proposed what he called "Damage Risk Criteria for Noise," expressed in octave bands.



A DOSIMETER strapped to his wrist and one in his pocket check the amount of radioactivity to which this workman is exposed while filing samples from radioactive piston rings. The hot ring is mounted in a vise behind a 4-inch iron shield in a hood, shielded on the other three sides and below with a foot of concrete. Long-handled tongs and tools are used, and checked for contamination with a survey meter. A filter for monitoring air-borne activity is mounted at the edge of the window.

In 1954, the American Standards Association published a report of an Exploratory Subcommittee Z24-X-2 entitled "The Relation of Hearing Loss to Noise Exposure" [10]. This report was an evaluation of the results of investigation of available information which could be used to establish the relation between hearing loss and noise exposure. It does not suggest a definite criterion.

[EDITOR'S NOTE: The work of ASA Committee Z24 has now been assigned to three committees, S1, S2, and S3. The part that concerns the effect of noise on industrial workers is under the jurisdiction of Sectional Committee S3, Bioacoustics, sponsored by the Acoustical Society of America.]

More recently, the Subcommittee on Noise in Industry of the Committee on Loss of Hearing of the American Academy of Ophthalmology and Otolaryngology has proposed that three middle octave bands are the critical ones in the production of hearing loss from noise. They are, therefore, suggesting that a criterion could be based upon these three bands. The conclusions that they have reached have been based largely upon the work of the American Standards Association Z24-X-2 committee and on the research of their own subcommittee.

The work discussed above is confined to the effects of continuous steady-state noise. For intermittent, very short exposures, levels above those suggested for continuous exposure can probably be tolerated. At very high levels, however, not only is there a possibility of damage to hearing but there is evidence that these levels may also cause non-otologic effects such as blurred vision, disturbance of equilibrium, and similar effects.

Impact noises are those which are characterized by sharp peaks of a few milliseconds duration. The period between the peaks may vary from the order of magnitude of a few seconds to many minutes. During the period between peaks, the exposure will be the ambient noise level. Because of problems of measurement and the lack of good data, very little progress has been made in the establishment of standards for impact noise. The ambient noise levels between peaks, the severity of peak exposure, and the duration of the peaks are all factors which will influence the level ultimately adopted. It has been reasonably well established, however, that peak noises (having a duration of a few milliseconds) of the order of magnitude of 10 decibels (db) per octave above the criterion for steady-state noise may not be damaging.

In the research which has been done so far one important factor emerged, namely, that a single over-all sound level measurement (20 to 10,000 cycles per second) does not provide an adequate basis for the establishment of any criterion or safe level. It has been well established by such workers as Kryter, Beranek, Rosenblith, and Stevens, as well as the American Standards Association Exploratory Subcommittee Z24-X-2 that a noise must be analyzed in bands at least as narrow as one octave before the potential hazard of the noise can be evaluated. There are many factors which must be considered in setting up standards to deal with noise. In adopting such standards there are several requirements which must be fulfilled [11]. These are:

1. The criterion must be established in measurable perameters. It must be expressed in terms of sound pressure level and frequency. The distribution of energy through the audible spectrum is an important variable. It may be spread through the whole spectrum or it may be confined to relatively narrow bands. The band widths and distribution of the important components of a noise must be defined, since damage may be related to these factors.
2. The time of exposure must be specified. Consideration must be given to levels for continuous (throughout the work day) steady noise exposures; steady noise with intermittent exposure (periodic during the day); and single or very short exposure (corresponding to acute exposures in toxicology).
3. The time pattern of the noise will have an important bearing on criteria. The levels for repeated impact noise may be significantly different than for steady noise. Peak value, average value, ambient noise, and the interval between peaks are all significant.
4. The final values selected for damage risk criteria must be based on the physical factors given above and must then be related to the degree deviation from normal hearing which is considered acceptable. In this latter category such factors as presbycusis and a definition of just what constitutes a hearing loss must be included.
5. Any standard must be supported by substantial agreement among authorities before it can be accepted. It is, therefore, of primary importance that any criteria which are proposed must be supported by a reasonable amount of valid data.

Hygienic Standards for Radiation

Standardization has been going on for many years in the field of radiation protection on both a national and international scale. In 1929, the Advisory Committee on X-ray and Radium Protection was formed in the United States at the suggestion of the International Commission on Radiological Protection. This original committee has since become known as the National Committee on Radiation Protection. It is organized under the sponsorship of the National Bureau of Standards and is composed of a series of eleven subcommittees, each of which has responsibility for a particular field of interest. The activities of this committee go far beyond the mere establishment of safe limits. They have published a series of handbooks which include detailed specifications for the various areas under consideration. These handbooks issued to date cover a wide range of subjects [12]. Of these, three, Safe Handling of Radioisotopes, Maximum Permissible Amounts of Radioisotopes in the Human Body, and Maximum Permissible Concentrations in Air and Water, deal specifically with standards, the others cover methods.

Until recently, all of the handbooks of the National Committee on Radiation Protection represented recommendations and suggestions for good practice. The most

recent release from this organization, Handbook 61 [13], refers to regulation of radiation exposure by legislative means. While the committee states that it does not recommend or oppose the incorporation of its findings in state codes, it does propose that if there is to be regulation it should be done on a uniform basis in all states. The purpose of Handbook 61 is to suggest a basis of uniformity in the promulgation of rules and regulations applying to uses of radioactive materials.

The American Standards Association has also been involved in the development of suggested standards in the field of radiation. In 1946, a "Safety Code for the Industrial Use of X-Rays" [14] was published as a "war standard" to be used as a guide in radiation protection. In view of the increasing activity in the nuclear energy field the American Standards Association has established (1956) the Nuclear Standards Board. The function of this Board is to provide standards of all kinds in the field of nuclear energy. One activity of this group will be in the field of radiological safety.

[EDITOR'S NOTE: One of the seven sectional committees now working under the supervision of the Nuclear Standards Board is Radiation Protection, N7. The committee is sponsored by the Atomic Industrial Forum, Inc, and the National Safety Council.]

There are many ways in which the radiation problem differs from that involving toxic materials. In the first place, there are several different kinds of radiation involved; second, injury may result either from overexposure to external radiation or as a result of inhaling or ingesting radioactive materials. Third, in addition to the concern for immediate injury to individuals, there are problems associated with effects on life span, and the more significant genetic effects which may influence future generations. In other words, the radiation problem involves not only the individual but world population. This is all complicated by the fact that in addition to the industrial exposure to humans, normal background exposure, medical exposures, and the newer problem of radioactive fallout from weapons testing are all factors. As a result it is difficult to obtain agreement as to what numbers should be used as safe levels. The tendency today is to select lower and lower values. There is little doubt that present levels are safe for the exposed individual, but consideration of possible genetic effects has resulted in lowering of the standards to levels far below those which will produce obvious radiation injury. Maximum permissible doses of radiation will unquestionably remain in a state of flux until such time as more valid information as to the long-time effects of such exposures is available.

Conclusion

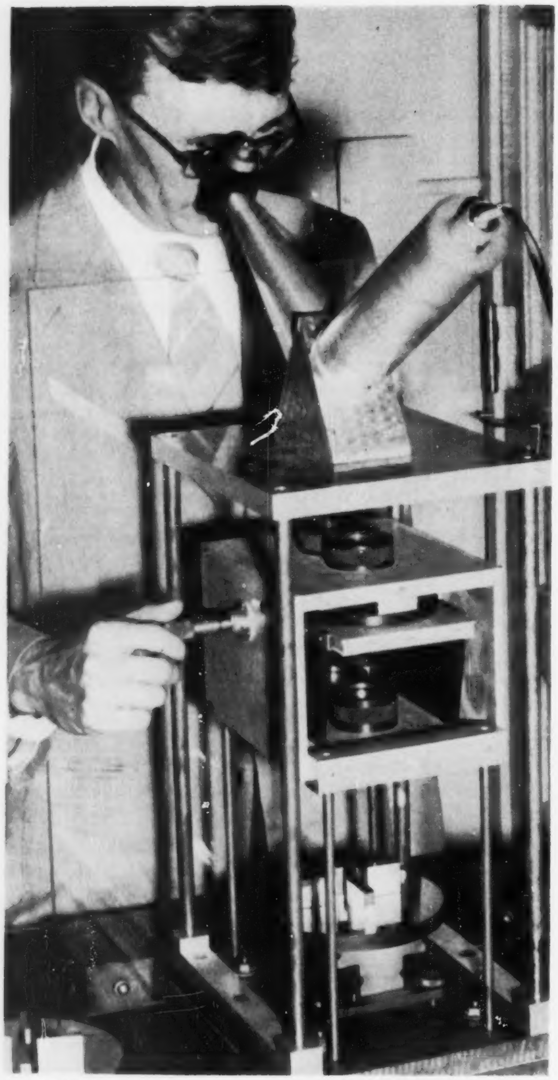
The value of having standards in all of the various phases of occupational health is unquestioned. The most difficult problem is to establish the validity of such standards. The greatest weakness results from the lack of data, particularly with regard to human experience. Only by an accumulation of such information will it be possible to establish our standards on such a basis that they will be universally accepted. In order to help solve this problem it would be helpful if the area of interest could be widened and substantially more information made available in the establishment of hygienic standards. It is suggested that, particularly in the field of standards for toxic materials, an international group be established to accumulate and evaluate available information from industrial experience and animal experimental work and to attempt to provide validated hygienic standards for daily inhalation. Such a coordinated approach would greatly strengthen this important aspect of occupational disease control.

BIBLIOGRAPHY

1. Allowable Concentration of Carbon Monoxide. American Standard Z37.1-1941. American Standards Association, New York.
2. U. S. Public Health Service. Manual of Industrial Hygiene, p 264, W. M. GAFAFER, Editor; Saunders, Philadelphia, Pennsylvania, 1943.
3. COOK, W. A., Maximum Allowable Concentrations of Industrial Atmospheric Contaminants. Industrial Medicine, Vol. 14, pp 936-946, 1945.
4. American Conference of Governmental Industrial Hygienists, 1947 M. A. C. Values. Ind. Hygiene Newsletter Vol. 7, pp 15-16, Aug. 1947.
5. American Conference of Governmental Industrial Hygienists. Threshold Limit Values for 1956. AMA Archives of Industrial Health, Vol 14, pp 186-189, Aug. 1956.
6. SMYTH, H. F., Jr. Improved Communication. Hygienic Standard for Daily Inhalation. American Industrial Hygiene Association Quarterly, Vol. 17, pp 129-185, June 1956.
7. STERNER, J. H., CROUCH, H. C., BROCKMYRE, H. F., and CUSACK, M., A Ten Year Study of Butyl Alcohol Exposure. American Industrial Hygiene Association Quarterly, Vol. 16, pp 53-59, 1949.
8. WEBER, H. J., Threshold Limits, A Panel Discussion. American Industrial Hygiene Association Quarterly, Vol. 16, No. 38, 1955.
9. KRYTER, K. D., The Effects of Noise on Man. Journ. of Speech and Hearing Disorders. Monograph Supplement No. 1, Sept. 1950.
10. The Relation of Hearing Loss to Noise. Report of Exploratory Subcommittee Z24-X-2; 1954. American Standards Association, New York.
11. WILLIAMS, C. R., Criteria for an Evaluation of Noise Problems. Amer. Ind. Hygiene Association Quarterly Vol. 17, No. 3, pp 319-326, Sept. 1956.
12. National Bureau of Standards, U. S. Dept. of Commerce. Handbooks 42, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59 and 60, Washington, D. C.
13. Regulation of Radiation by Legislative Means, Handbook 61. National Bureau of Standards, U. S. Dept. of Commerce, Washington, D. C. 1955.
14. Safety Code for the Industrial Use of X-Rays, American Standard Z54.1-1946. American Standards Association, New York.

The Thirteenth International Congress on Occupational Health will meet at The Waldorf-Astoria, New York, July 25-29, 1960. *Prevention will be the major theme. Aspects of occupational health to be considered include administrative methods, medical and surgical practices, education and training, social and legal aspects, work physiology and psychology, environmental factors in health, environmental hygiene, and hazards of specific industries. Information about the Congress can be obtained from Dr Robert E. Echardt, Secretary-General, P. O. Box* 51, *Linden, N. J.*

INTERNATIONAL YARD



THIS high-precision interferometer at the National Bureau of Standards compares gage-block lengths with an accuracy of 1 part in 10 million. The gage blocks are used as master standards for controlling dimensions in the manufacture of such items as ball bearings, machine tools, and guided missile components.

THE DIRECTORS of the following standards laboratories:

Applied Physics Division, National Research Council, Ottawa (Canada)

Dominion Physical Laboratory, Lower Hutt (New Zealand)

National Bureau of Standards, Washington (United States of America)

National Physical Laboratory, Teddington (United Kingdom)

National Physical Research Laboratory, Pretoria (South Africa)

National Standards Laboratory, Sydney (Australia)

have discussed the existing differences between the values assigned to the yard and to the pound in different countries. To secure identical values for each of these units in precise measurements for science and technology, it has been agreed to adopt an international yard and an international pound having the following definition:

the international yard = 0.9144 meter
the international pound = 0.453 592 37 kilogram.

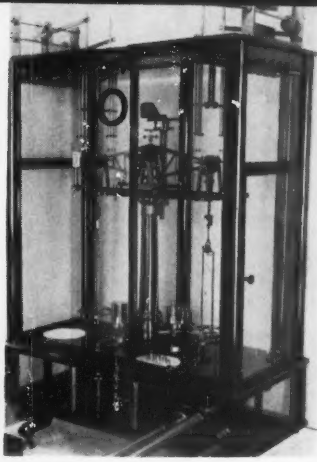
It has also been agreed that, unless otherwise required, all non-metric calibrations carried out by the above laboratories for science and technology on and after July 1, 1959, will be made in terms of the international units as defined above or their multiples or submultiples.

The Background and Use of the New Units Within the U. S.

The international inch, derived from the international yard, is exactly equal to 25.4 millimeters. This value for the inch has been legally adopted by Canada. Also this value was approved by the American Standards Association for "inch-millimeter conversion for industrial use" in 1933 (American Standard B48.1-1933), was adopted by the National Advisory Committee for Aeronautics in 1952, and has been adopted by many standardizing organizations in other countries.

At present for the calibration of line standards and end gages having nominal lengths expressed in inches,

& POUND



SMALL BALANCE of high precision in which the National Bureau of Standards compares standard weights for microbalances with the standards of mass maintained at the Bureau.

the National Bureau of Standards is using the inch defined by the Mendenhall order (Fundamental Standards of Length and Mass, Bulletin No. 26, United States Coast and Geodetic Survey by T. C. Mendenhall) published in 1893. The values corresponding to this order are approximately:

1 yard = 0.91440183 meter
1 inch = 25.4000508 millimeters

These are derived from the exact relation:

1 yard = $\frac{3600}{3937}$ meter

The inch used by the National Physical Laboratory of the United Kingdom for its calibrations is defined by the equation:

1 inch = 25.399956 millimeters

It will be noted that the International Inch is approximately 2 parts per million shorter than the inch presently used by the National Bureau of Standards, and somewhat less than 2 parts per million longer than the inch now used by the National Physical Laboratory. To avoid possible confusion, during the transition period National Bureau of Standards calibrations of length or mass expressed in English units will embody a statement indicating clearly the unit which has been used if the choice introduces a significant difference in the calibration values. Furthermore, if the accuracy of the calibration is such that the certified values would be the same in either "international" units or the older units, the qualifying adjective "international" will not be used, i.e., the values will be expressed, for example, as so many inches or pounds.

The Coast and Geodetic Survey has requested the following exception with which the National Bureau of Standards concurs:

"Any data expressed in feet, derived from and published as a result of geodetic surveys, shall tacitly bear the relationship:

1 foot = $\frac{1200}{3937}$ international meter

"This relationship shall continue in being, for the purpose given herein, until such a time as it becomes desirable and expedient to re-adjust the basic geodetic survey networks in the United States, after which the ratio, as implied by the international yard, shall apply."

This unit shall be referred to as the American Survey Foot. Inasmuch as there is little or no interchange of survey data, where the foot measurements are used, with industrial and scientific data, where the international units will be used, it is anticipated that no confusion will result from this dual usage. For example, base line surveys which might enter into a velocity of light determination would invariably be made in terms of meters.

The values of the pounds currently in use in the United States, United Kingdom, and Canada are as follows:

1 U. S. pound	= 0.453 592 4277	kg
1 British pound	= 0.453 592 338	kg
1 Canadian pound	= 0.453 592 43	kg
1 International pound	= 0.453 592 37	kg

The relative differences in the various pounds are substantially less than in the yards but since masses can be measured with greater accuracy than lengths, the differences can be significant. The present British pound is about one part in ten million smaller than the international pound, whereas the U. S. and Canadian pounds are about one and one-half parts in ten million larger.

The conversion factor for the international pound was selected so as to be exactly divisible by 7 to give the following value for the grain:

1 international grain = 0.06479891 gram

The grain is the common unit in avoirdupois, apothecary, and troy pounds. There are 7000 grains in the avoirdupois pound, and 5760 grains in both the apothecary pound and the troy pound.

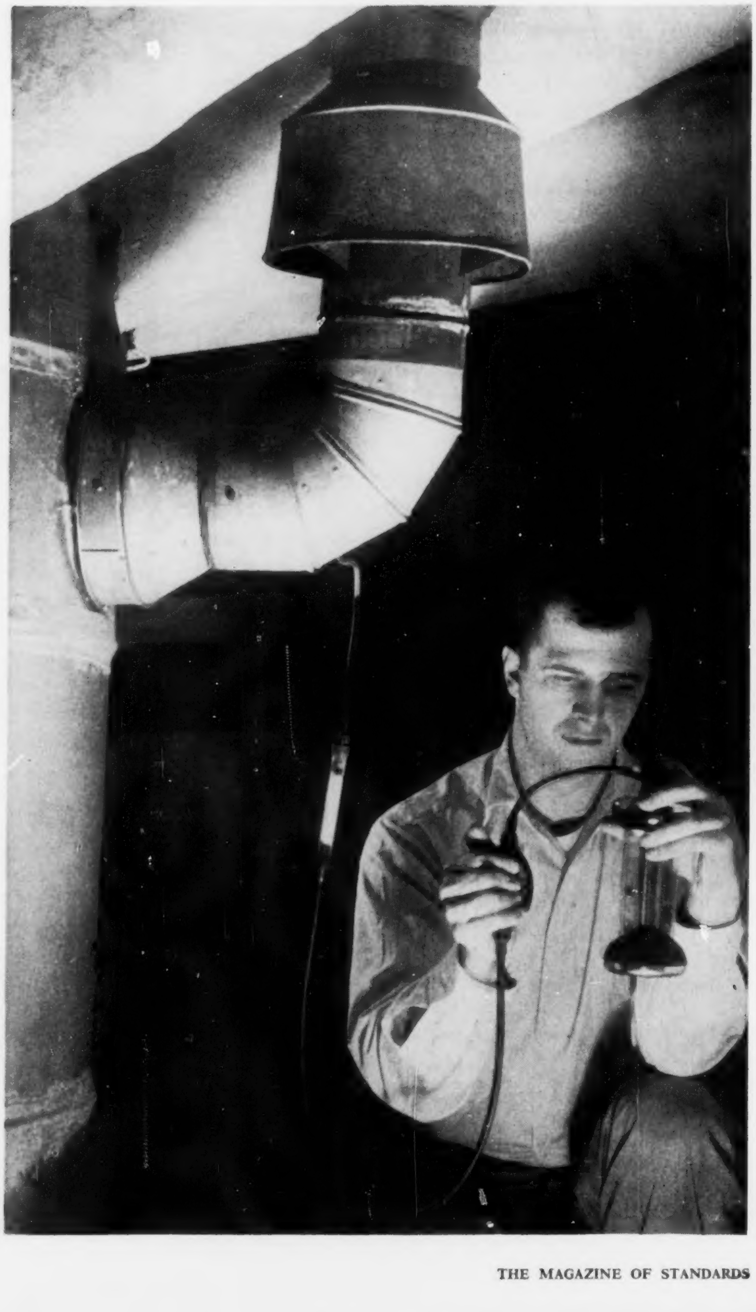
The standard U. S. gallon and the imperial gallon are so substantially different that a compromise international gallon was not practicable. The U. S. gallon is defined as equal to 231 cubic inches. On the other hand, the imperial gallon is defined as the volume of 10 pounds of water under specified standard conditions. A fairly exact relationship is:

1 imperial gallon = 1.20094 U.S. gallons

or less exactly:

1 imperial gallon = 6/5 U.S. gallons

Gas Appliances Testing up to date



SAFETY and efficiency of gas furnace is checked by serviceman as he measures CO_2 in flue.

American Gas Association

by H. L. McPHERSON

ADVANCE DESIGN CONCEPTS are reflected in revisions and additions to 16 current American Standards for gas appliances and accessories which were approved as American Standard during July and August 1958 and became effective for testing on January 1, 1959. The revisions were made in order to keep the gas industry's appliance safety and performance standards up to date with the advancing technology of the gas industry.

The new requirements apply to gas-fired boilers, central furnaces, floor furnaces, vented recessed heaters, free-standing domestic ranges, built-in domestic cooking units, clothes dryers, water heaters, side-arm type water heaters, room heaters, incinerators, unit heaters, and duct furnaces. In the accessory field, the revisions apply to manually operated gas valves, relief and automatic gas shut-off valves for use on water heating systems, and domestic gas conversion burners.

The ASA Sectional Committee, Project Z21, AGA Approval Requirements Committee, is the committtee responsible for establishment of minimum or basic requirements for the safe operation, durable construction, and reasonable performance of gas-burning appliances as well as for such laboratory methods of test as are necessary to determine compliance with the provisions. In addition, the committee prepares the requirements for the installation of low-pressure gas piping in buildings extending from the gas meter outlet to the inlet connection of the appliance.

The committee is sponsored by the American Gas Association, and functions under the procedures of the American Standards Association. Representatives from gas utilities, equipment manufacturers, and a number of general consumer interest groups comprise the active working members of the committee. This committee also exercises supervision over the preparation and revision of the standards for gas appliances and accessories by directing the activities of 24 subcommittees, each composed of membership highly specialized in its respective category. Supervision is achieved through initiation of assignments as well as by the final disposition of the requirements developed.

At this meeting, the committee adopted a complete rewrite of the previous standard for relief and automatic gas shut-off valves. The standard has been renamed "American Standard Listing Requirements for Relief Valves and Automatic Gas Shut-Off Devices for Hot Water Supply Systems." Of particular importance are the minimum dimensions and flow areas specified for these safety devices to promote longer life and improved dependability.

MR McPHERSON is supervisor, publicity and publications, of the American Gas Association Laboratories at Cleveland, Ohio.

Inlet and outlet connections of combination temperature and pressure relief valves and of temperature relief valves having rated capacities of over 15,000 British thermal units (Btu) per hour are not to be smaller than a ¾-inch National Pipe Thread (N. P. T.) threaded connection. The cross-sectional dimension of any flow-way of such devices is not to be less than 3/16 inch and no device is to have an orifice less than 7/16 inch diameter. Under these provisions a temperature relief valve is rated on the steam discharged at a 15 pounds per square inch (psi) tank pressure.

The new standard for relief valves requires that all spillage-type devices incorporating a pressure-relief feature shall be provided with a means for manually unseating the valve disc a distance of at least 1/16 inch.

The American Standard covering the installation of domestic gas conversion burners in equipment designed for solid or liquid fuels has been editorially revised for greater clarity and has been printed in pocket size to facilitate its use. Approximately 35,000 copies of the previous edition of this standard are currently in use. It is anticipated that the new pocket size edition will be used to a greater extent than previous editions.

Under the new requirements covering testing of domestic gas conversion burners, a new test appliance is specified for testing in-shot-type burners. This new test appliance is in line with the type of equipment used and the practice of installing liquid-fuel-type heating equipment in urban areas with the thought that conversion will be made to gas at a later date.

In the revised electrical provisions for domestic gas clothes dryers, a new specification requires the use of a three-conductor supply cord with a plug of the parallel-blade grounding type. The use of three-conductor supply cords of the grounding type for connecting appliances with electrical controls has been increasing in recent years and is now specified for certain locations in the National Electrical Code. The type of grounding means specified has become standard on power tools, air conditioners, and washing machines. With this arrangement, there is much less chance of a clothes dryer not being effectively grounded than when relying on the installer to make this attachment.

Small aluminum swatches coated with a temperature-sensitive solution that changes state at 250 F are now used to measure the drying chamber temperature of a gas clothes dryer. The swatches are stapled to a number of the cloth pieces forming the test load. This test procedure is used to determine any over-temperature condition in the dryer that might cause discoloration. Tests by the AGA Laboratories indicate that the new procedure provides a reliable means to determine if the temperature in a drying chamber is more than 250 F.

In the central-heating gas appliance field, the requirements for central furnaces, boilers, floor furnaces and vented recessed heaters has been expanded to require a "blocked port" test for multi-flame pilots. In this test, multi-flame pilots are to effect ignition of the main burner gas within four seconds from the time gas is admitted to the burner when all the pilot flame ports except those for heating the thermal element are blocked, and the pilot gas supply is reduced to an amount just sufficient to keep the valve of the device open.

At the option of the manufacturer, vented room heaters may be tested and approved with a 1-inch clearance to the wall at the back or at the back and one side under the revised standard for room heaters. When tested in this manner, the maximum temperature on the walls adjacent to the unit and at points on the walls extending above the unit and 3 feet in front of the unit is not to exceed 90 F above room temperature.

The wall and floor temperature test for free-standing domestic gas ranges has been extensively revised. The revisions permit approval of insulated ranges with a 1-inch spacing or flush at the back, with ½-inch spacing at the sides; eliminate the classification of uninsulated ranges; and provide for measurement of temperature on vertical walls extending above the cooking top on both sides of the range when spaced from the range as specified by the manufacturer.

These revisions to the American Standards for gas appliances reflect the desire of the Approval Requirements Committee and its subcommittees to serve fully the needs of both the gas industry and the consumer through adequate standards. Most of the standards handled under Project Z21 are continuously under review and more than 40 subcommittee or working group meetings are held annually to keep the provisions up to date.

The American Standards for gas appliances and accessories form the backbone of the gas industry's Appliance Approval Program. Under the program, gas equipment manufacturers voluntarily submit their new models to the AGA Laboratories for test and approval. Manufacturers having models which are found to comply fully with the provisions of the appropriate standard are then granted permission to display the Laboratories' registered Approval Seal on each approved model. Display of the Approval Seal signifies that the unit complies with national standards for safe operation, durable construction, satisfactory performance, and long life of trouble-free service.

NEW STANDARD TELLS *how to apply Gypsum Wallboard*

by R. H. Faber, *Technical Secretary, Gypsum Association; Secretary, Sectional Committee A97*

NEW METHODS OF APPLICATION and new uses are recognized in the completely revised standard specification for application of gypsum wallboard, American Standard A97.1-1958, now available. A revision of the original specification written in 1953, the new edition was approved by the American Standards Association late in 1958.

Major areas of revision include recommendations for the application of wallboard in bath and shower areas for the reception of tile surfacings, recommendations for the use of the annular ring GWB-54 gypsum wallboard nail, a new method of application to wood framing members known as the "double nailing" method, and also a new table for maximum allowable spans between supports for the various thicknesses of gypsum wallboard.

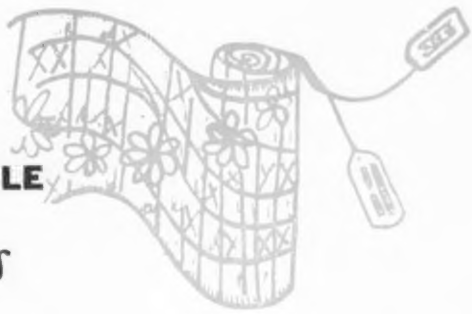
This standard is one of the most popular in the construction industry. Over 30,000 copies of the 1953 edition were printed and distributed. It is anticipated that at least this many, and probably more, copies of the 1958 edition will be printed. Already 9,000 copies of the new standard have been distributed.

It is widely used by architects, contractors, and building code authorities. It has been adopted by reference by several of the model building codes and many city and state building codes.

The new standard is known as American Standard Specifications for Gypsum Wallboard Finishes, A97.1-1958; UDC 691.31. The AIA file number is No. 23-L. The sponsors are the American Institute of Architects and the Gypsum Association.

Copies of American Standard A97.1-1958 are now available at 75 cents each from the American Standards Association.

Reported by P. J. FYNN *for Subcommittee 1, and* H. C. DONALDSON *for Subcommittee 2*



WORK FOR COMPARABLE *textile tests*

A DELEGATION of seven persons representing the American Standards Association, USA member-body of the International Organization for Standardization, attended meetings of ISO/TC 38 Subcommittees 1 and 2 held September 10-13, 1958, in Lucerne, Switzerland. Leader of the delegation for Subcommittee 1 was P. J. Fynn, J. C. Penney Company, New York, N. Y. Leader of the delegation for Subcommittee 2 was H. C. Donaldson, Cluett Peabody & Company, Troy, N. Y.

Other delegates were Dr Ruby K. Worner, in charge of Product Evaluation Instrumentation and Analysis, U. S. Department of Agriculture, Agricultural Research Service, Southern Utilization, Research and Development Division, New Orleans; Werner Klass, Testfabrics, Inc, New York; C. H. A. Schmitt, Sandoz Chemical Works, Inc, New York; J. E. Norton, Atlas Electric Device Company, Chicago; and C. E. Hilton, ASA staff and acting secretary of the U. S. committee for ISO/TC 38, Textiles. All delegates except Mr Hilton are members of the American Association of Textile Chemists and Colorists and participate as well in the affairs of the American Society for Testing Materials.

CONSIDERABLE PROGRESS was made at meetings in September on development of international tests for colorfastness and shrinkage of textiles. The meetings of Subcommittee 1 on Colorfastness and Subcommittee 2 on Shrinkage of the International Organization for Standardization's Technical Committee 38 were held in Lucerne, Switzerland, September 10-13, 1958.

Subcommittee 1 on Colorfastness

Over the last ten years, Subcommittee 1 has hammered out a series of 21 test methods covering colorfastness of textiles to various treatments, from acid and alkali spotting to daylight exposure and washing. These methods have been debated in detail until they are acceptable (on majority vote of all countries represented) as satisfactory international standard procedures. They form the nucleus of a series of standard tests designed to cover all possible textile colorfastness tests. Further tests to add to those already voted were discussed at the September meetings. Accepted by the subcommittee for consideration by the full technical committee were tests for colorfastness to sublimation in storage; steaming; solvent crocking; dry cleaning; and daylight. Accepted as tentative were tests for colorfastness to burnt gas fumes using the U. S. test ribbon and fade standard; formaldehyde; and steam pressing. Use of additional specified standard depths of shade for testing dye-fastness was also accepted. Already accepted were shades at twice standard depth and 1/25 standard depth. Three more were voted in at the September meetings—1/3, 1/6, and 1/12 of standard depth of shade.

The Daylight Exposure Test adopted is practically identical to the procedure of the American Association of Textile Chemists and Colorists' Tentative Test Method 16C-1957. The chief point of difference which previously prevented U. S. approval of the present ISO method was the exclusive use of continental standard dyeings for test comparisons. In the current session, the U. S. delegation obtained acceptance of the U. S. standard dyeings on a par with the continental standards for use as an alternate.

Still under very active discussion in working groups of the Colorfastness Subcommittee are colorfastness to washing, artificial light, weathering, vulcanizing, chlorinated water, perspiration, crocking, and the use of standard test fabrics in colorfastness tests.

In washfastness testing an AATCC method and a roughly comparable European method exist for each of four test categories. To gather data to unify these methods and weld them into one acceptable to all, the Canadian Secretariat has organized a series of international interlaboratory tests on 29 different fabrics. It was proposed at the Lucerne meeting that an additional mechanical test to simulate handwashing colorfastness but with features different from the AATCC Standard Test Method 36-1957, Procedure I, be included in the series. A procedure was developed and will be forwarded to the Canadian Secretariat.

Colorfastness to artificial light—carbon arc—was debated actively but delegates from all countries except the USA voted unanimously against using any form of carbon arc lamp test. The vote was in favor of developing a test method based on the Xenon lamp.

Colorfastness to weathering was considered, but apparently it requires a very considerable amount of work

Good Housekeeping

COLORFASTNESS is one of the tests on which ISO Technical Committee 38 is working. Here, a fadeometer is being used to test colorfastness of textile samples.

by a working group before a method can be drafted.

The Vulcanizing Working Group considered two proposed methods, but decided that it must gather more information on industrial practice in various countries before an acceptable test can be expected.

Chlorinated water tests need supporting information to be obtained by correspondence. If a revised form is acceptable to Germany, France, Switzerland, the United Kingdom, and the USA, it will be circulated by correspondence for a vote of the subcommittee.

Perspiration colorfast tests are hanging fire on the question of the use of histidine, optimum concentrations, and stability of test solutions.

Crocking tests for fabrics are pretty well agreed upon, but an international test must take account of crocking tests for fiber stock also. The working group will consider new machines recently introduced for the purpose.

Standard test fabrics as proposed by the USA are generally acceptable, but it was pointed out by Czechoslovakia that all countries cannot obtain such fabrics from a central source; therefore, any specifications for standard fabrics should include sufficient fiber and yarn information to enable each country to make its own if need be. The acceptance is postponed pending development of the necessary data.

Subcommittee 2 on Shrinkage

A report on a very comprehensive series of interlaboratory tests (see page 83) done under the direction of the USA Secretariat made possible the unanimous acceptance of a method for determining shrinkage to laundering of woven goods. The accepted method follows very closely the Standard Test Method 14-1953 of the American Association of Textile Chemists and Colorists for determining shrinkage.

The acceptance by the ISO working group of this test based on a 60-minute cycle represents a major triumph of persuasion for the American delegation inasmuch as most European members were previously very strongly committed to an 80-minute test and some advocated an even longer cycle of 100 minutes. The very thorough interlaboratory work directed by the USA Secretariat provided the technical background which dispelled previous opposition.

All were agreed that sooner or later the problem of dimensional restorability will have to be faced and a method evolved which will cover inherently extensible fabrics such as knit goods and some woven goods of linen.

Gratifying Progress Achieved

There was excellent representation at the Lucerne sessions, which were attended by active contingents. Working groups labored afternoons and evenings to perfect many test methods for acceptance. There was a good spirit of cooperation among the delegates with no deliberate obstructionism. The general consensus was that considerable progress had been made.

Good Housekeeping

SHRINKAGE in fabrics is determined by careful measurements taken before and after laundering.

FABRIC SHRINKAGE TEST EVALUATED

Results of an Interlaboratory Study

THE NATIONAL STANDARDIZING BODIES of 15 countries took part in the interlaboratory study of a test method for fabric shrinkage in washing referred to by Mr Donaldson (see page 81). Purpose of the study was to obtain a basis for agreement on a standard method that would facilitate international trade in textiles. The study was planned and coordinated by staff members of the National Bureau of Standards under the auspices of the American Standards Association. Data derived from the intercomparison showed a striking similarity in the test results of the various laboratories, and also indicated that the test method is easily reproducible. It was therefore submitted to Technical Committee 38 of the International Organization for Standardization (ISO) for review and possible use as the basis for an International Recommendation.

Cooperating in the effort were 20 laboratories in Belgium, Canada, Czechoslovakia, Denmark, France, Germany, Japan, Netherlands, Norway, Poland, Sweden, Switzerland, Union of South Africa, the United Kingdom, and the United States. Ten of the fabrics were supplied by mills in this country and six by organizations in England. The fabrics were cut into specimens, labeled, and shipped to the participating laboratories by the American Association of Textile Chemists and Colorists Laboratories, Lowell, Massachusetts, and the British Launderers' Research Association Laboratories in London.

The method studied was substantially a standard test that has been followed for several years in the United States to evaluate the effect of high-temperature laundering on dimensional changes in woven fabrics.[1] The test machine and soap solution recommended are similar to those used in commercial laundering. The 16 textile specimens were selected for use in the test because of their known behavior when subjected to repeated tests or launderings.

With the exception of the duration of the test, all requirements of the test method had been agreed upon before the study was undertaken. The American Standards Association had suggested a 60-minute test because it is less costly to perform. However, as some of the participants felt that longer tests would be necessary in order to obtain values for the ultimate fabric shrinkage, three different testing periods—60, 80, and 100 minutes—were scheduled.

Analysis of the test results showed that repeated applications of the 60-minute test gave reliable data on progressive shrinkage. The results obtained in the laboratory test were in close agreement with the results of repeated commercial laundering. It was found in some cases that less shrinkage occurred in the longer time tests than in the 60-minute test. The short test period was therefore specified in the method submitted for international adoption.

The standard deviation expressing variability between duplicate fabric specimens tested at different times in the same laboratory was 0.56 in percent shrinkage, and the standard deviation between duplicate specimens tested in different laboratories was 0.85 in percent shrinkage. An increase in the fabric load from 0.5 pound to 3 pounds per cubic foot in the testing machine's cage space had very little effect upon average dimensional changes.

[1] For further technical details, see Test for dimensional changes in woven fabrics in high-temperature laundering, by William D. Appel, *American Dyestuff Reporter* **47**, 213 (1958).

This is the eighteenth installment in the current series of rulings as to whether unusual industrial injury cases are to be counted as "work injuries" under the provisions of American Standard Method of Recording and Measuring Work-Injury Experience, Z16.1-1954. The numbers in parentheses refer to those paragraphs in the standard to which the cases most closely apply. These cases are issued periodically by the Z16 Committee on Interpretations.

Case numbers in the current series start with 400. Cases 400-500 have been reprinted with an index prepared by the National Safety Council. To make it easy to locate all cases applying to any section of the standard, the index is arranged both numerically by paragraph number of the standard and numerically by case number. Each index reference includes a brief description of the case. Reprints are 75 cents per copy, available from ASA.

Sectional Committee Z16 is sponsored by the National Safety Council and the Accident Prevention Department of the Association of Casualty and Surety Companies.

Are These Cases Work Injuries?

Case 600 (1.2.4)

A company set forth various examples of time lost, and asked for an interpretation of paragraph 1.2.4 in relation to these accidents. For instance, the day after the accident: (1) the employee was late reporting for work because of actual disability associated with the injury. However, after being seen by the doctor he returned to a regularly established job that same day, and lost no further time from work. (2) The employee reported for work at his regular time, but saw the doctor in the early afternoon, and was sent home for the remainder of that day, but lost no further time from work. (3) The employee worked the full period of his regular shift, but the following day he reported late for work because he could not keep his appointment with the doctor until later in the morning. After his appointment he continued to work, and no further time was lost from work. (4) The employee was late reporting for work because due to his injuries it was undesirable for him to travel by means of public transportation, and he was unable to arrange for other means of transportation immediately. However, he worked the remainder of his shift, and there was no other loss of time. (5) It was undesirable for this employee also to travel by means of public transportation, and although he reported for work at his regular time, it was necessary for him to leave the job early. There was no other loss of time.

Decision: The committee concluded that all of the examples should be considered as medical treatment cases, and should not be included in the frequency and severity rates on the basis that the employees in each of these cases had worked at least a part of each day.

Case 601 (5.2)

A company questioned whether the placement of the comma following the word "accident" in paragraph 5.2 (a) inferred that an "accident" was something other than an "incident such as a slip, trip, or fall . . ." as compared with paragraph 5.1 (a).

An employee whose job required repetitive handling of standard mail sacks weighing up to an authorized maximum of 80 pounds was lifting a sack weighing somewhat less from the floor to a work bench and strained his back. There was no history of an accident, nor of an incident such as a slip, trip, or fall (other than the act of lifting and the straining of his muscles), nor of sudden effort (effort occurring or coming unexpectedly, or which was unforeseen or unprepared for), nor of overexertion (the employee knew the approximate weight of the sack and was required to handle similar sacks in the same manner many times daily), nor a blow on the back.

Decision: The committee members agreed that the placing of the comma in paragraph 5.2 did not have any particular significance. It was believed that the intent of the standard was to consider as non-reportable those cases which merely *manifested* themselves on the job, but which did not result from the employee's work; whereas, it was not the intent to consider as non-reportable those injuries which were work connected, even though the work might be the employee's usual activity. It was considered that lifting an 80-pound sack from the floor to a work bench constituted an incident, thus satisfying 5.2 (a). A doctor's opinion of the situation would have to be obtained before it could be determined whether or not 5.2 (b) was satisfied.

Case 602 (1.6)

An employee with a history of a non-industrial injury to his shoulder had previously been in an automobile accident. Upon his return to work a medical examination had indicated that he had a "trick" shoulder, and upon the doctor's recommendation he was no longer employed on any job requiring him to lift his arm above his shoulder, nor on any job that required lifting.

The employee was used at night as a crane man. Since the night crew was limited, only two crane men were needed. There were four buildings, and at times these crane men were used in any of the four buildings. During the course of one of these changes, the employee was walking with another employee, and complained his shoulder snapped out of place. He was in extreme pain and was immediately rushed to the hospital. The fellow employee stated that the only actual effort the injured employee was doing at the time was walking—no carrying of material was involved, and the aisles were clean and smooth.

Decision: The committee concluded that this should not be included in the work injury rates on the basis that hitching the load on the crane had nothing to do with this injury.

Case 603 [A1.6 (i) and 5.6]

During the coffee break, an engineer draftsman and a co-worker were standing in an aisle between rows of drafting tables. The engineer draftsman, standing back two or three feet, was preparing to shoot a rubber band at his co-worker's cup of coffee, which was standing on a table. The co-worker raised his hand to ward off the rubber band being aimed. Thinking the co-worker was possibly going to grab his hand, the engineer draftsman pulled back suddenly, jabbing his thumb in his eye.

The injured employee was taken to the first aid station where he received emergency treatment, and was sent to an eye specialist who diagnosed the condition as contusion of left eyeball with hemorrhage, and confined the employee to the hospital. The employee last 13 days from work.

Decision: The committee concluded that this injury should be included in the work injury rates since this was considered a case of horseplay and happened during a rest break.

Case 604 [A1.6 (f)]

Fifteen minutes before her shift began, an employee who worked in Building A was walking along the hallway of Building B in order to purchase a roll for the morning coffee break from an employee in Building B who sold these rolls outside of working hours as a sideline. The employee in question had not been in her regularly assigned building that morning, but stopped off at Building B for the sole purpose of purchasing the roll. As she was walking, the woman slipped and fell, striking her wrist and fracturing it. She had not punched her time card nor did she have any reason to enter Building B insofar as her work was concerned. Investigation disclosed that the area in which the employee fell was well illuminated, and there was no evidence of slipperiness on the floor or any other hazard which was even broadly construed as a work hazard.

Decision: The committee concluded that this injury should be included in the work injury rates on the basis that the employee was walking from one part of the plant to another, and the circumstances were not changed by the fact that she intended to purchase food.

Case 605 (5.2)

An employee with a history of a bad back was a member of a clean-up crew, and his normal work was shoveling grain and grain products with a scoop shovel. On the day in question he was using a scoop to shovel up some material on the floor when he felt a catch in his back. He stopped work for a few minutes' rest, then felt he could continue working. As he stooped over to pick up an empty bag his back caught again, and he was unable to straighten up for several minutes. He reported this immediately, and was sent to a doctor. The doctor returned the employee to light work. The employee worked on three days, but the third day he went back to the doctor because his back kept getting worse. The doctor hospitalized him.

Decision: The committee decided that shoveling grain might be an event which would satisfy the requirements of paragraph 5.2 (a), but the real answer in this case depended upon the doctor's opinion as to whether or not this activity constituted overexertion for this particular employee. The members agreed that if the doctor believed this activity was overexertion, the case should be included in the rates; otherwise, it should not be included in the work injury rates.

Case 606 (5.2)

An employee with a history of back trouble moved furniture in her home, after which her back ached, although she was able to get around. Two days later her back still ached, but she reported to work, and was able to walk as usual. However, as she was walking across the room she stepped on a rubber band. She did not fall, but received a quick jerk. The employee was wearing oxford shoes. After her slip she had more pain than before and could not work at all. She reported this to her supervisor, and was sent to see the doctor. The doctor examined the employee and sent her to the hospital where she remained for 17 days. About one month later the doctor stated that he believed the employee would be able to return to work in about two weeks.

Decision: The committee decided that this injury should be included in the work injury rates. The members believed that, in spite of the history of back trouble, the specific incident which resulted in disability was a clearly defined occurrence, and although the employee was not feeling too well the day of the accident, she did go to work and was working until the slip occurred. On that basis the case falls within the provisions of paragraph 5.2.

Case 607 (1.6)

An employee suffered a fractured elbow and shoulder when he tripped over a ladder during a night shift in a poorly lighted area. Due to the type of work that this employee was engaged in, the plant physician placed a cast on the arm, extending from shoulder to elbow, and the employee returned to work.

Three weeks later, while at home, the employee attempted to walk down cellar stairs backwards in order to hold on to the stairway railing which was on the right side of the steps, and his right arm was in the cast. He was trying to use his left hand on the rail to support himself. He tripped and fell to the cellar floor and suffered a fractured pelvis, resulting in disability. The company wondered whether or not to count this accident, since the employee would not have been descending the stairs backwards if his right arm had not been in a cast.

Decision: The committee concluded that this injury should not be included in the work injury rates on the basis that the injury which arose out of and in the course of employment did not result in any lost time, and the actual loss of time was due to a new and subsequent injury in the employee's home.

Case 608 (1.6)

During a flight, the stewardess was in the buffet area of the plane eating her dinner, which had been prepared by the company kitchen. While eating a roll, the stewardess fractured a large silver filling in one of her teeth. There was no foreign object in the roll, but she lost four days from work because of this incident.

Decision: The committee decided that this case should be included in the work injury rates. The members realized that there was no question that this injury occurred during the course of the employee's work, and the decision depended upon whether or not it arose out of the work. Among the things that make air travel unique is that flights often occur through the eating hours, and in these circumstances the employees must eat during their work. For this reason it was considered that the act of eating on the part of this employee was part of employment, and because of these circumstances, an injury occurring during such eating time was considered as arising out of employment.

Case 609 (5.2)

An employee who had had recurrent back pain, which could occur at any time since an injury some seven years previous, was working with three other employees installing a wing fillet weighing approximately 100 pounds. While he was holding the wing fillet with the three other employees, he started to turn around. When he did this, he felt a severe pain in his back which resulted in 15 days lost time from work.

Decision: The committee decided that this case should be included in the work injury rates. Specifically, the fact that the employee had to turn while lifting and holding one end of the wing fillet constituted an incident sufficient to meet the requirements of paragraph 5.2 (a). The members suggested that the company confer with its doctor to determine whether or not the injury could have arisen out of this incident, thereby satisfying paragraph 5.2 (b).

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering copies of standards, please refer to the number following the title.

NOTE: A list of French standards published in English, with prices, is now available from the American Standards Association.

389 METROLOGY. WEIGHTS AND MEASURES

Norway (NSF)

Fundamental metric units, definitions and symbols NS 913M
The International System of Units, definitions and letter symbols NS 914M
Decimal multiples and submultiples, designations and letter symbols NS 915M

54 CHEMISTRY

Belgium (IBN)

Water analysis. Nitrite nitrogen. Griess colorimetric method NBN 515
Drinkable waters. Nitrate nitrogen NBN 525

Israel (SII)

Methods of testing water. Testing of temperature S.I. 249 (105)
Methods of testing water. Determination of pH value S.I. 249 (106)
Testing of water: Calcium content S.I. 249 (201)
Testing of water: Magnesium content S.I. 249 (202)
Fillings and filling solutions for portable foam extinguishers S.I. 283

Japan (JISC)

Method for determination of pH JIS Z 8802*

Mexico (DGN)

Orthohydroxide benzolic or salicycle acid K-53-1958

USSR

Orthophosphoric acid GOST 6552-58

615.4 PRACTICAL PHARMACY. MEDICINES. INSTRUMENTS. HOSPITAL EQUIPMENT

Poland

Sterilizers, medicinal PN Z-54980

Mexico (DGN)

Gloves for surgeons R-42-1957

United Kingdom (BSI)

Electrically heated incubators and cots for babies BS 3061:1958

621.6 FLUID DISTRIBUTION, STORAGE, CONTAINERS. PIPES. PUMPS

Canada (CSA)

Specification for universal cast iron pipe and fittings cast in sand-lined moulds, for water and other liquids B131.11-1958
Code for identification of piping systems B53-1958

Denmark (DS)

Hose-cock for town gas and mouth piece for gas apparatus DS 24
Straight-way gas cocks, sized 15 to 80mm DS 157
Angle gas cocks, sizes 20 to 40mm DS 158

Germany (DNA)

Dry-seal joints for seamless flared tubing for nominal pressure 25 DIN 8906
Compressed air pipes for switchboard, outside diameters DIN 43614

Poland

19 stds for different types of unions and smooth pipe joints and parts PN series M-74800

Roumania (CSS)

4 stds for different forged steel fittings for pressure of 100 kg/cm² STAS 1801-50

Switzerland (SNV)

2 stds for thermoplast pipes of soft polyethylene for cold water piping, nominal pressure 2.5, 4.6, and 10 VSM 18385/6
Flanges, survey of dimensions for nominal pressure 64 to 400, and diameters 10 to 1200mm VSM 18549

Union of South Africa (SABS)

Standard spec for black polyethylene piping for cold water services and drains SABS 533-1957

United Kingdom (BSI)

Cast and forged steel valves, screwed and socket-welding, sizes ¼ in. to 2 in. for the petroleum industry BS 2995:1958

Uruguay

Lead pipes for drainage and ventilation UNIT 124-58

621.798 PACKING AND DISPATCH. PACKAGING

Germany (DNA)

Round metal covers and bottoms, stamped DIN 2040

Norway (NSF)

Boxes for footwear NS 918
Fiberboard packing cases for footwear in boxes NS 919

Poland

2 stds for wooden pallets PN M-78210/1

United Kingdom (BSI)

Punnets and punnet trays BS 3050:1958

621.89 LUBRICATION

India (ISI)

Gear lubricant, regular IS:1277

Switzerland (SNV)

Dilution of lubricating oils by gasoline SNV 81055
Dilution of lubricating oils by petroleum and Diesel fuel SNV 81056
Lubricating greases, consistence, penetration SNV 81126

USSR

Lubricating oil, type MT GOST 6360-58
Testing for barium content in lubricant GOST 7187-58

621.91 ROUGHING, PLANING, SHAPING, MILLING, ETC

Japan (JISC)

Gleason style tools for straight bevel gear generator JIS B 4351*
Gear hobs JIS B 4354*
Fine pitch gear hobs JIS B 4355*
Pinion cutters JIS B 4356*

Netherlands (HCNN)

Surface roughness. Principles NEN 630-1

643/645 HOUSEHOLD EQUIPMENT

New Zealand (NZSI)

Std spec for thermal storage electric water heaters NZS 720:1957
Std spec for clothes lockers NZS 1187:1957
Std spec for domestic electric cooking ranges NZS 1303:1958
Std spec for food mixing machines (institutional) NZS GP 23:1956
Std spec for food mincers (institutional) NZS GP 24:1956
Std spec for steam jacketed pans NZS GP 26:1957
Std spec for food slicing machines (institutional) NZS GP 34:1956
Std spec for wrought aluminum alloy cooking utensils and appliances NZS GP 38:1957

661 CHEMICALS (FINE, HEAVY, ETC)

Argentina (IRAM)

Anhydrous ammonia for industrial use IRAM 1141
Sulfur for agricultural use IRAM 12450

Japan (JISC)

Agar JIS K 8263*

United Kingdom (BSI)

Methanol BS 506:1958

USSR

Tri-sodium sulfite, technical GOST 201-58
Nitric acid, concentrated GOST 701-58
Methyl-ether GOST 8883-58
Dimethylaniline, technical GOST 2168-58

675 LEATHER INDUSTRY

Argentina (IRAM)

3 stds for leathers, methods of measuring the tearing and bursting strength IRAM 8513/5

678.5 PLASTICS

Roumania (CSS)

13 stds for different tests on plastics STAS 5795/5801-58, 5870/5-58

77 PHOTOGRAPHY AND CINEMATOGRAPHY

Japan (JISC)

Badge film for X-rays JIS K 7557*

United Kingdom (BSI)

Sizes of photographic paper for general use BS 1112:1958

USSR

Apparatus for measuring film lengths GOST 8910-58

news briefs.....

● **Gaillard Seminar**

Thirteen conferees attended Dr John Gaillard's private seminar on Industrial Standardization held in New York City, January 26 through 30, 1959. They represented eleven industrial organizations and two military activities as listed below. Those marked by an asterisk were represented at one or more previous Gaillard seminars.

- * American Machine & Foundry Co
- Chandler-Evens Corp
- Electro-Voice, Inc
- Imperial Oil Ltd (Canada)
- * International Business Machines Corp
- * The Lummus Co
- North American Aviation, Inc
- * Rock Island Arsenal Ordnance Corps
- * Ordnance Weapons Command
- Polytechnic Research & Development Co
- T. W. & C. B. Sheridan Co
- * Texas Instruments, Inc
- * Whitin Machine Works

The next Gaillard Seminar will be held in the Engineering Societies Building, New York City, June 22 through 26, 1959. For details and advance registration, write to Dr John Gaillard, 135 Old Palisade Road, Fort Lee, New Jersey.

● W. D. APPEL, chairman of Committee L23, USA Committee for the international work on textiles, ISO/TC 38, has retired as chief of the Textiles Section and assistant to the chief of the Organic and Fibrous Materials Division of the National Bureau of Standards. Mr Appel joined the Bureau in 1922 as a dye chemist and has been section chief since 1929. His efforts on behalf of textile research, testing, and standards have earned him every major professional honor of the industry.

Mr Appel's services will not be lost to standards. He will work with the American Association of Textile Chemists and Colorists, editing the annual Technical Manual and as coordinator for supplements to the Association's Color Index published in cooperation with the British Society of Dyers and Colourists. He will also continue to serve as chairman of Committee L23.

● THE AMERICAN MEDICAL ASSOCIATION recommends that industry use the lighting standards sponsored by the Illuminating Engineering Society and approved by the American Standards Association. The AMA committee on ophthalmology, Council on Industrial Health, made the recommendation in reporting on a study of the effect of fluorescent lighting in industrial plants. Suspicions that fluorescent lighting may be injurious to the eyes are unfounded, the committee declares, but recommends that the level of illumination be checked in accordance with the approved standards. The committee's findings are contained in reports published in the September 1958 *Journal* of the AMA.

Among other recommendations for eye protection, the committee states that safety goggles should meet the specifications of the National Bureau of Standards. The Bureau's specifications are those of American Standard Z2-1938 (NBS Handbook H24) which is now being revised under the Bureau's sponsorship.

● NEW PROCEDURES have been adopted for approval of electrical equipment sold in European countries, reports H. P. Michener. Mr Michener, assistant manager, Engineering and Safety Regulations Department, National Electrical Manufacturers Association, acted as U.S. observer at the 1958 meeting of the International Commission on Rules for the Approval of Electrical Equipment (CEE). A Reciprocal Licensing Body has been set up to simplify the handling of approval procedures, he says. Under the new procedures a manufacturer will no longer be obliged to send his products to each separate country for approval since approval in three countries, including the country of origin, will imply approval by all countries participating in the scheme. It was pointed out, however, that uniform specifications are essential.

There is a trend away from specification of unnecessary construction details in CEE standards, it was reported. Mr Michener found that comments on U.S. practice were received with interest during the meetings, although he pointed out that formal U.S. comments on standards being considered by the CEE would receive equal consideration with those of the other countries. There were no comments to present at the 1958 meetings.

● IT IS NOT TOO EARLY to start preliminary standardization in connection with the use of nuclear energy for power. Dr Henry H. Hausner, consultant in nuclear fuels, made this statement at the First International Symposium on Nuclear Fuel Elements held at Columbia University during the week of January 26. He pointed out that the standards might be of a temporary nature only.

Discussions among the more than 500 participants at the symposium indicated that standardization is desirable, especially in European countries. Although no standard research and test reactors exist, most of the more than 60 research reactors operating or under construction all over the world show quite a similarity in design, it was pointed out.

Dr Lee L. Davenport, president of the Sylvania-Corning Nuclear Corporation, also emphasized the importance of standardization in reducing

costs in the nuclear power field. "In order to achieve our cost goals we must use every ingenious idea at our command," he said. "Industrial experience has shown that one of the most powerful tools for cost reduction is standardization. The adoption of standards will also materially ease reactor design, engineering, and construction problems."

"If our designers and engineers will direct even a small portion of their energies toward the adoption and utilization of standards in the nuclear industry, we will find the overbearing problem of high costs melting away," Dr Davenport declared.

● TO FIND OUT what safety regulations apply to conveyors, the Conveyor Equipment Manufacturers Association recently wrote all of the 49 states, the District of Columbia, Puerto Rico, and Hawaii. Replies were received from all 52 agencies. In its letter the association called attention to the American Standard Safety Code for Conveyors and Conveying Equipment, B20.1-1957, and also to the new industry dictionary, American Standard Conveyor Terms and Definitions, MH4.1-1958.

Although 47 of the agencies reported that they have no safety regulations applying specifically to conveyors, 30 said that they use American Standard B20.1-1957 as their guide in questions concerning conveyor safety. One state, Maryland, said that American Standard B20.1-1957 is referred to in the state code and thereby has attained legal status. Iowa, Kentucky, New Jersey, and Pennsylvania are either writing or contemplating writing a law. In addition, four of the agencies said that conveyors are named in their safety requirements and nine said that they apply general machinery safety rules to conveyors.

● J. W. SCALLAN, president of the Pullman-Standard Car Manufacturing Company, now represents the American Railway Car Institute on ASA's Standards Council. Mr Scallan started with the Pullman Company in 1926. In 1932 he became

Fabian Bachrach

John W. Scallan

sales manager of the Western Division of Pullman-Standard Car Manufacturing Company, and continued with the company in a number of executive positions until he was named president in 1958. He is director of several companies in addition to the Pullman companies, including the M. W. Kellogg Company and Trailmobile, Inc. He is also vice-chairman of the Railway Progress Institute.

● THE CEMENTED CARBIDE PRODUCERS ASSOCIATION has named R. J. Stuart, supervisor of engineering, Vascoloy-Ramet Corporation, Waukegan, Illinois, as its representative on ASA's Standards Council. Mr Stuart has been associated with the corporation as chief engineer for the past ten years. Previously employed as chief tool en-

R. J. Stuart

gineer for a major machine tool builder, he is a graduate of Industrial Management Institute at Lake Forest College. Mr Stuart is chairman of the Standards Committee of the Cemented Carbide Producers Association, and a member of the Society of Carbide Engineers, the American Society of Tool Engineers, and the American Institute of Plant Engineers.

● THE FIRST TEN STANDARDS issued by the new Egyptian Organization for Standardization (EOS) have been received by the American Standards Association. The standards are published in Arabian, but an English translation of the titles shows they cover: Cast iron, kerosine pressure stoves; prepared animal feed; aluminum sulfate for purifying drinking water; quicklime and hydrated lime for purifying drinking water; chlorinated lime for sterilizing drainage and drinking water; copper sulfate for treatment of drinking water; ferrous sulfate; standard method for taking samples of drainage water for chemical analysis; cast-iron pipes.

The President of the Republic of Egypt proclaimed the creation of the Egyptian Organization for Standardization in 1957. This grew out of work done by the Egyptian Ministry for Industry which since 1950 had issued "marks of guaranteed quality" of products manufactured in Egypt.

The membership of EOS, which is now the competent authority for all matters concerning standardization in Egypt, consists of representatives of industry and government as well as private organizations interested in standardization.

The EOS is administered by a Council consisting of from 10 to 15 members with the Minister for Industry as presiding officer. The members of the Council are nominated by the President on recommendation of the Minister for Industry. The Council may be assisted by technical advisors who may attend the meetings but who have no voting power.

The principal objectives of EOS include establishment of standard specifications for materials and products, classification, terminology,

definitions, and symbols; measures for ensuring the conformity of materials and products with standards; greater interchangeability of parts and improved standards for Egyptian products; coordination of the work carried on in Egypt with that of standards associations in other countries.

The expenses of EOS are budgeted by the Ministry for Industry.

● FOLLOWING the general conference as a result of which the American Standards Association decided not to initiate a project on a building code for one- and two-family homes, two of the major code groups have announced plans to publish separate pamphlets covering their code recommendations pertaining to house construction. The Building Officials Conference of America and the Southern Building Code Congress are the two groups.

The International Conference of Building Officials at Los Angeles already has put its code provisions for one- and two-family units in a separate publication.

● S. F. SPENCE, chairman of ASA's Safety Standards Board, has been elected chairman of the Manufacturing Chemists' Association's General Safety Committee. Mr Spence is director of Safety and Loss Prevention for the American Cyanamid Company.

● A CODE OF ETHICS, which includes agreement to conform to all applicable building codes, has been agreed upon by contractors who install heating and air conditioning systems on Long Island, N. Y. Contractors have joined their union employees in establishing the code. Among the code provisions are agreements to guarantee their work for at least one year, to service all equipment throughout its life, and to conform to building codes, fire-prevention regulations, and nationally recognized standards, such as those of the American Society of Heating and Air Conditioning Engineers, the National Warm Air Heating Institute, and those approved by the American Standards Association.

● EXPRESSING his desire that the programs of the American Standards Association and the U.S. Department of Commerce continue to be coordinated to the fullest extent possible, the new Secretary of Commerce, Lewis L. Strauss, has appointed two observers to attend meetings of ASA's Standards Council. John Green, director of the Office of Technical Services, and A. T. McPherson, associate director of the National Bureau of Standards, will represent the Department.

The appointments were announced after a delegation from ASA, headed by ASA's new president, J. R. Townsend, called on Admiral Strauss to offer ASA's continued cooperation to the Department. Admiral Strauss told the group that he sees no conflict between the standards work of the U.S. Department of Commerce and that of ASA.

"Instead," he said, "it seems to me that there are many opportunities for cooperation with mutual benefit. I gather that my predecessors held a similar opinion and I am glad to endorse their views. I can also assure you of our continued support in all of the scientific and technical aspects of standardization, including such activities as service on committees and boards, the sponsorship of standards, and participation in the annual conferences on standardization."

● GREATER INTERCHANGEABILITY of tool parts for portable power tools is the purpose of the new American Standard B5.38-1958, Driving and Spindle Ends for Portable Air and Electric Tools. The standard applies to portable power tools for drilling, grinding, polishing, sawing, and driving threaded fasteners (nut runners). Percussion tools are not covered.

Portable power tools are used widely in construction, shipbuilding, and other industries where the work cannot be taken into the machine tool shop. The tools are also frequently used on assembly lines.

The new standard includes dimensions and tolerances for both driving and driven elements where such coordination is important and not established by reference to other pertinent American Standards.

Tool parts covered include spindles for geared chucks, threaded fastener drives, including hexagonal and square drives, abrasion tool spindles, and circular saw arbors.

Sponsors of Committee B5, which prepared the standard, are the Metal Cutting Tool Institute, the Society of Automotive Engineers, the National Machine Tool Builders' Association, the American Society of Tool Engineers, and The American Society of Mechanical Engineers.

The committee kept close liaison with other organizations concerned, including the Electric Tool Institute, the Compressed Air and Gas Institute, the Service Tools Institute, the Grinding Wheel Institute, the U.S. Bureau of Ships.

Copies of American Standard B5.38-1958, Driving and Spindle

WITH SINCERE REGRET the American Standards Association has learned of the death of R. Oakley Kennedy, former member of ASA's Board of Directors. Mr Kennedy served as a member-at-large on the Board for ten years, from 1946 to 1956. He also had a special interest in the work of the Consumer Goods Standards Board, on which he retained his membership until 1957.

Mr Kennedy was a retired vice-president of Cluett, Peabody & Company, and had served as a consultant for Ekholm Associates of Boston, the Ginsberg Machine Company, Inc, and the Scovill Manufacturing Company of Waterbury, Conn. He was a trustee of Russell Sage College and a director of the Boston and Albany Railroad. He was also a member of the Newcomen Society and the Society for the Advancement of Management. Mr Kennedy died at 73 years of age, after a six-month illness.

Ends for Portable Air and Electric Tools, are available at $1.50 each.

● TO MAKE AVAILABLE the widely scattered literature on standardization, Dr N. A. J. Voorhoeve, The Netherlands, has established an abstracting service which he is offering on a subscription basis. "Internorm," as Dr Voorhoeve calls his service, is the only abstracting service specializing in standardization in the world. It covers more than 4000 periodicals. So far, approximately 600 descriptions of standardization publications have been selected for abstracting yearly. The abstracts are published in lists and on cards (75 x 125 mm). The lists are arranged in accordance with the UDC classification system. The cards are presented either in alphabetic arrangement or in systematic arrangement according to the UDC classification number. Titles of the publications are given in the original language with a translation in English. The abstracts themselves are presented in English.

Lists and cards are both being published monthly.

Subscriptions may be entered for abstracts in selected UDC classifications as well as for the entire card file or lists. Information concerning the library where photocopies or microfilms of the articles or pamphlets abstracted can be obtained will be given on request.

For further information write Dr N. A. J. Voorhoeve, Consulting Engineer for Standardization and Coding, Parklaan 87, Eindhoven, The Netherlands.

● A COMPLETE ENGINEERING GUIDE on highway lighting based on American Standard Practices for Street and Highway Lighting has just been published by the Street and Highway Safety Lighting Bureau. The book reviews light sources available, luminaire fundamentals of design, quality specifications, and installation and maintenance. Copies can be obtained at $1.00 from the Street and Highway Safety Lighting Bureau, 1400 Terminal Tower, Cleveland 13, Ohio.

AMERICAN STANDARDS
JUST PUBLISHED

If your company is a member of the American Standards Association, you are entitled to receive membership service copies of these newly published American Standards. Find out who your ASA contact is in your company. Order your American Standards through him. He will make sure your company receives the membership service to which it is entitled.

BUILDING AND CONSTRUCTION

Gypsum Wallboard Finishes, Specifications for, A97.1-1958 (Revision of A97.1-1953) $0.75

Sponsors: American Institute of Architects; Gypsum Association

Glazed Ceramic Wall Tile Installed in Portland Cement Mortars, A108.1-1958
Ceramic Mosaic Tile Installed in Portland Cement Mortars, A108.2-1958
Quarry Tile and Pavers Installed in Portland Cement Mortars, A108.3-1958
Bound together $1.50

Sponsor: Tile Council of America, Inc

ELECTRIC AND ELECTRONIC

Single and Heavy Nylon-Coated Round Copper Magnet Wire, NEMA MW6-1957; ASA C9.8-1958 $0.80

Single - Paper - Covered Round Copper Magnet Wire, NEMA MW31-1956; ASA C9.9-1958 $0.50

Paper-Covered Rectangular and Square Copper Magnet Wire (One Paper ¾ Lap or Four Intercalated Papers), NEMA MW33-1957; ASA C9.10-1958 $0.50

Glass - Fiber - Covered Rectangular and Square Copper Magnet Wire, NEMA MW42-1957; ASA C9.11-1958 $0.80

Sponsor: National Electrical Manufacturers Association

Current-Limiting Reactors, Requirements, Terminology, and Test Code for, C57.-16-1958 (Revision of C57.16-1956) $2.00

Applies to current-limiting reactors connected in series with phase conductors for limiting the current that can flow in a circuit under short circuit conditions. Rating, construction, temperature rise, tests, short circuit, terminology, service conditions, losses, and impedance are covered.

Sponsor: Electrical Standards Board

Rubber Insulating Tape, Tentative Specifications for, ASTM D 119-57T; ASA C59.6-1958 (Revision of ASTM D 119-48T; ASA C59.6-1952) $0.30

Varnished Cotton Fabric and Varnished Cotton Fabric Tapes Used for Electrical Insulation, Methods of Testing, ASTM D 295-58; ASA C59.31-1958 $0.30

Product Uniformity of Phenolic Laminated Sheets, Methods of Test for, ASTM D 634-44; ASA C59.32-1958 $0.30

Dimensions of Rigid Tubes Used for Electrical Insulation, Methods of Measuring, ASTM D 668-52; ASA C59.33-1958 $0.30

Dimensions of Rigid Rods Used in Electrical Insulation, Methods of Measuring, ASTM D 741-52; ASA C59.34-1958 $0.30

Varnished Glass Fabrics and Varnished Glass Fabric Tapes Used for Electrical Insulation, Methods of Testing, ASTM D 902-56; ASA C59.35-1958 $0.30

Ozone Resistant Rubber Insulating Tape, Tentative Specifications for, ASTM D 1373-57T; ASA C59.37-1958 $0.30

Silicone Varnished Glass Cloth and Tape for Electrical Insulation, Tentative Specifications for, ASTM D 1459-57T; ASA C59.38-1958 $0.30

Sponsor: American Society for Testing Materials

GAS-BURNING APPLIANCES

Relief Valves and Automatic Gas Shut-Off Devices for Hot Water Supply Systems, Listing Requirements for, Z21.22-1958 [Revision of Z21.22-1935 (R1953)] $1.50

Sponsor: American Gas Association

MECHANICAL

Twist Drills, B5.12-1958 (Revision of B5.12-1950) $2.00

Sponsors: American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers; American Society of Mechanical Engineers

PHOTOGRAPHY

Motion-Picture Safety Film, PH22.31-1958 (Revision of Z22.31-1946) $0.35

16mm Flutter Test Film, Magnetic Type, PH22.113-1958 $0.35

Sponsor: Society of Motion Picture and Television Engineers

WOOD AND WOOD PRESERVATIVES

Terms Relating to Timber, Definitions of, ASTM D 9-30, ASA O4.5-1958 $0.30

Domestic Hardwoods and Softwoods, Nomenclature of, ASTM D 1165-52; ASA O4.6-1958 $0.30

Terms Relating to Veneer and Plywood, Definitions of, ASTM D 1038-52; ASA O7.2-1958 $0.30

Sponsor: American Society for Testing Materials

AMERICAN STANDARDS UNDER WAY

Legend — Standards Council — *Approval by Standards Council is final approval as American Standard; usually requires 4 weeks.* Board of Review — *Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.* Standards Board — *Approves standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.*

Status as of February 18, 1959

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

In Standards Board

Magnetic Recording Instruments for the Home — Wire Size, Speed, Spools, Z57.4-

Sponsor: Institute of Radio Engineers

DRAWINGS, SYMBOLS AND ABBREVIATIONS

American Standards Approved

American Standard Drafting Manual, Section 10, Metal Stampings, Y14.10-1959 (Partial revision of Z14.1-1946) Section 17, Fluid Power Diagrams, Y14.17-1959

Sponsors: American Society of Mechanical Engineers; American Society for Engineering Education

ELECTRIC AND ELECTRONIC

American Standard Approved

Armored Cable, Safety Standard for, C33.9-1959 (7th ed. of UL 4)

Sponsor: Underwriters' Laboratories

In Board of Review

400-Watt BT-37 (HI) Fluorescent Mercury Vapor Lamp, Dimensional and Electrical Characteristics of, C78.1304- (Revision of C78.1304-1957)

400-Watt BT-37 (HI) Mercury Vapor Lamp, Dimensional and Electrical Characteristics of, C78.1305- (Revision of C78.1305-1957)

Sponsor: Electrical Standards Board

In Standards Board

Television Luminance Signal Levels, Method of Measurement of, C16.31-

Sponsor: Institute of Radio Engineers

Schedules of Preferred Ratings for Power Circuit Breakers, C37.6- (Revision of C37.6-1957)

Sponsor: Electrical Standards Board

MECHANICAL

In Standards Board

Reamers, B5.14- [Revision of B5.14-1949 (R1955)]

Sponsors: American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers; American Society of Mechanical Engineers

MISCELLANEOUS

In Standards Board

Nursery Stock, Z60.1- and addendum Z60.1a-1955 (Revision of Z60.1-1952)

Sponsor: American Association of Nurserymen, Inc

PHOTOGRAPHY

Reaffirmation Approved

Designation of Emulsion Side of Photographic Sheet Films, PH1.19-1944 (R1958)

Sponsor: Photographic Standards Board

PLASTICS

American Standards Approved

Ethyl Cellulose Molding Compounds, Specifications for, ASTM D 787-55; ASA K64.1-1959

Cellulose Acetate Plastic Sheets, Specifications for, ASTM D 786-49; ASA K64.2-1959

Cellulose Nitrate (Pyroxylin) Plastic Sheets, Rods, and Tubes, Specifications for, ASTM D 701-49; ASA K64.3-1959

Compressive Properties of Rigid Plastics, Methods of Test for, ASTM D 695-54; ASA K65.1-1959

Stiffness Properties of Nonrigid Plastics as a Function of Temperature by Means of a Torsional Test, Method of Test for, ASTM D 1043-51; ASA K65.2-1959

Rockwell Hardness of Plastics and Electrical Insulating Materials, Method of Test for, ASTM D 785-51; ASA K65.3-1959

Deformation of Plastics Under Load, Methods of Test for, ASTM D 621-51; ASA K65.4-1959

Haze and Luminous Transmittance of Transparent Plastics, Method of Test for, ASTM D 1003-52; ASA K65.5-1959

Luminous Reflectance, Transmittance, and Color of Materials, Method of Test for, ASTM D 791-54; ASA K65.6-1959

Index of Refraction of Transparent Organic Plastics, Methods of Test for, ASTM D 542-50; ASA K65.7-1959

Specific Gravity of Plastics, Method of Test for, ASTM D 792-50; ASA K65.8-1959

Total Chlorine in Vinyl Chloride Polymers and Copolymers, Method of Test for, ASTM D 1303-55; ASA K65.9-1959

Dilute Solution of Viscosity of Vinyl, Chloride Polymers, Method of Test for, ASTM D 1243-58T; ASA K65.10-1959

Ammonia in Phenol-Formaldehyde Molded Materials, Method of Test for, ASTM D 834-57; ASA K65.11-1959

Acetone Extraction of Phenolic Molded or Laminated Products, Method of Test for, ASTM D 494-46; ASA K65.12-1959

Molds for Test Specimens of Plastic Molding Materials, Specifications for, ASTM D 647-57; ASA K66.1-1959

Apparent Density and Bulk Factor of Granular Thermoplastic Molding Powder, Method of Test for, ASTM D 1182-54; ASA K66.2-1959

Shrinkage from Mold Dimensions of Molded Plastics, Methods of Measuring, ASTM D 955-51; ASA K66.3-1959

Sponsor: American Society for Testing Materials

SAFETY

American Standards Approved

Safety Code for the Installation and Operation of Pulverized-Fuel Systems, Z12.1-1959 [Revision of Z12.1-1957 (2nd ed.)]

Safety Code for the Prevention of Dust Explosions in Starch Factories, Z12.2-1959 (Revision of Z12.2-1957)

Safety Code for Pulverizing Systems for Sugar and Cocoa, Z12.6-1959 (Revision of Z12.6-1953)

Safety Code for the Prevention of Dust Explosions in Coal Preparation Plants, Z12.7-1959 (Revision of Z12.7-1953)

Sponsor: National Fire Protection Association

TEXTILES

In Board of Review

Cotton Yarns, Methods of Testing and Tolerances for, ASTM D 180-57T; ASA L14.13- (Revision of ASTM D 180-54T; ASA L14.13-1956)

Sewing Threads, Methods of Testing, ASTM D 204-57T; ASA L14.14- (Revision of ASTM D 204-42; ASA L14.14-1949)

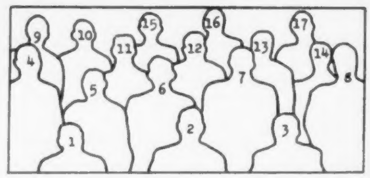
Man-Made Staple Fibers, Methods of Testing, ASTM D 540-57T; ASA L14.-33- (Revision of ASTM D 540-44; ASA L14.33-1949)

Felt, Methods of Testing, ASTM D 461-57T; ASA L14.52- (Revision of ASTM D 461-53; ASA L14.52-1955)

Spun and Filament Yarns Made Wholly or in Part of Man-Made Organic Base Fibers, Methods of Testing, ASTM D 1380-57T; ASA L14.90- (Revision of ASTM D 1380-56T; ASA L14.90-1957)

Sponsors: American Society for Testing Materials; American Association of Textile Chemists and Colorists

WHAT'S NEW ON AMERICAN STANDARDS PROJECTS



MEMBERS of B1 Subcommittee 11: (1) W. H. Gourlie, The Sheffield Corp; (2) R. P. Trowbridge, General Motors, chairman; (3) H. L. Seekins, General Electric; (4) R. B. Belford, Industrial Fasteners Institute; (5) L. H. Oest, Parker-Kalon; (6) F. L. Calkins, Wright Field; (7) M. A. Schultheis, Hughes Aircraft Co; (8) S. W. Taylor, ASA; (9) S. B. Terry, The Pipe Machinery Co; (10) G. A. Stimson, Greenfield Tap & Die Corp; (11) W. G. Waltermire, Lamson & Sessions; (12) I. H. Fullmer, National Bureau of Standards; (13) P. J. DesJardins, Pratt & Whitney; (14) Frank Philippbar, ASME; (15) W. C. Stewart, Industrial Fasteners Institute; (16) E. J. Heldmann, Holo-Krome Screw Corp; (17) H. G. Atwater, IBM Corp.

Standardization and Unification of Screw Threads, B1—

Sponsors: The American Society of Mechanical Engineers; Society of Automotive Engineers

Subcommittee 11 on International Cooperation met December 18, 1958, at the Lamson & Sessions plant in Cleveland. Roy Trowbridge, General Motors Corporation, Detroit, is chairman. The subcommittee discussed a paper written by J. R. Field of the Mechanical Engineering Research Laboratory, East Kilbride, England, comparing the tests of screws made to the Unified system with those of screws made to the British system. The paper had appeared in the June 13, 1958 issue of the British publication *Machinery*. As a result of the discussion, the subcommittee is investigating U. S. literature and test data to check on Mr Field's evidence which seems to indicate that in certain sizes the British screws are stronger than those made to the Unified system.

The subcommittee also discussed the gaging of screw threads, particularly as related to international recommendations. In the course of the discussion of the entire international activity, it was indicated that the group plans to try to continue to build as good representation for the USA at future international meetings as it had at the ISO meetings at Harrogate in 1958.

Electric and Magnetic Magnitudes and Units, C61—

Sponsor: Electrical Standards Board

Dr C. C. Chambers, vice-president in charge of engineering affairs, University of Pennsylvania, has been named chairman. Dr Chambers, a scientist with membership in an impressive number of professional societies, represents the American Association for the Advancement of Science on the committee. He is a Fellow of the American Institute of Electrical Engineers and of the Institute of Radio Engineers, both of which he represents on various sectional committees of ASA. He is chairman of the Steering Committee of Sectional Committee C63, Radio Interference, and has served as chairman of the Subcommittee on Radio Interference Definitions. Dr Chambers is a member-at-large on the U. S. National Committee of the International Electrotechnical Commission, and is international chairman of IEC Technical Committee 24, Electric and Magnetic Magnitudes and Units. He is also technical adviser to the USNC on the work of IEC/TC 24.

Carl C. Chambers

Standards for Electric Lamps, C78—

Sponsor: Electrical Standards Board

Uniform color appearance is the purpose of Proposed American Standard Specifications for the Chromaticity of Fluorescent Lamps, C78.376, just published for a period of approximately one year's trial use. Color center values and toler-

ances for 40-watt, T-12 fluorescent lamps of the white, cool white, warm white, and daylight types are given. The proposed standard is based on the work of the Lamp Testing Engineers Conference, as well as on the availability of standard lamps that may be used for testing. The standard test lamps were developed as a result of measurements made by the National Bureau of Standards. They are available from the Electrical Testing Laboratories.

Copies of Proposed American Standard C78.376 can be obtained from the American Standards Association at 60 cents each.

Suggestions for improvements will be welcomed. They should be addressed to the American Standards Association, 70 E. 45 Street, New York 17, N. Y.

Electric Lamp Bases and Holders, C81—

Sponsor: Electrical Standards Board

Seventeen proposed American Standards have been completed by the sectional committee and published for a year's period of trial and criticism. Fourteen of the proposed standards give dimensions and gaging requirements for lamp bases. This is the first time standards have been developed by Sectional Committee C81 for the lamp bases furnished by the base manufacturers to the manufacturers of lamps for assembly into the completed lamp. Three other proposed American Standards provide standard requirements for the gages to be used in checking the dimensions and strength of the bases.

George W. Caplis, Lamp Division, Westinghouse Electric Corporation, Belleville, N. J., is chairman of the subcommittee, C81-9, that developed the proposed standards.

Specialty Transformers, C89—

Sponsor: National Electrical Manufacturers Association

An error has been noted on page 36 of the American Standard Requirements and Terminology for Specialty Transformers, C89.1-1957. On this page, subsection 1-65.111 should read as follows:

1-65.111 The transformers shall be tested with the primary winding at rated frequency and at 120 volts or 240 volts for rated voltages of 115 or 230 volts, respectively, and with the secondary winding delivering current to a spark gap having a spacing of 1/8 inch if the secondary winding is rated less than 12,000 volts and 3/16 inch if the secondary winding is rated 12,000 volts or above. If the secondary winding is rated 10,000 volts or above, the temperature test shall be made with an air velocity of 50 feet per second across the spark gap.

Sizes of Shipping Containers, MH5—

Sponsors: The American Society of Mechanical Engineers; American Material Handling Society

The executive committee of Sectional Committee MH5, meeting on January 21, heard the reports of the MH5 subcommittee chairmen and made plans for helping the subcommittees expedite their work. Great interest in the progress of the work was shown by the large representation present at the meeting.

Chester J. Heinrich (left) and Herbert H. Hall, chairman of Committee MH5, inspect models of cargo-size containers during the January meeting of MH5 subcommittees.

The subcommittees are attempting to develop standard dimensions and designs to provide containers that can be interchanged among all forms of transportation without the contents being repacked. They are working on small containers (small enough to be handled by an ordinary lift truck); cargo size (intermediate); and van size (which might be used as a demountable truck body).

At the meeting, scale models of cargo containers were presented for study by Chester J. Heinrich, chairman of the Cargo Container Subcommittee. Mr Heinrich is technical director, U.S. Navy Supply Research and Development Facility, U.S. Navy Supply, Bayonne, N. J. The scale models, see picture, were prepared by the Navy and represented the various sizes that are being considered for inclusion in the proposed standard on container sizes. They illustrated not only the containers that are in use today, but others that might be selected to round out a family of containers for use by all industries. The Post Office Department also furnished templates of railway cars, highway vans, and small containers for study in relation to the proposed sizes of small containers. The van containers were also discussed.

Herbert H. Hall, consultant, Pittsburgh, Pa., is chairman of the sectional committee. Chairmen of the subcommittees are: Small Containers —T. J. White, American Material Handling Society; Cargo Containers —Chester J. Heinrich; Van Containers, co-chairmen—J. J. Clutz, Pennsylvania Railroad; John Gilbreth, Grace Line; International Cooperation—J. R. Immer, International Container Bureau.

Acoustics, S1—

Sponsor: Acoustical Society of America

Recognizing that much of the work being done by Committee S1 vitally concerns the work of Committees S2 and S3, a number of basic standards prepared by Committee S1 are being voted on by all three committees. Among those near completion is a revision of American Standard Acoustical Terminology, Z24.1-1951 (to be identified as S1.1-), and a draft standard on preferred frequencies for acoustics. This latter draft is identical, with minor changes, to one prepared by Technical Committee 43 of the International Organization for Standardization.

Committee S1 reports progress in revising the American Standard. Method for the Measurement of Sound, Z24.7-1950 (to be identified as S1.2-, when approved), and on a proposed American Standard Recommended Practices for Loudspeaker Testing, S1.5-, replacing American Standard C16.4-1942.

The use of weighting networks heads the list of questions on which

the committee is balloting in connection with the work of revising the American Standard Specification for General Purpose Sound Level Meters, Z24.3-1944 (to be identified as S1.4-).

Exploratory subcommittees are studying the need for standards on ultrasonic cleaning, tolerances of tuning of musical instruments, acoustic reference quantity notation, pressure calibration of laboratory standard pressure microphones, measurement of attenuation of sound in ducts, and testing electronic components in high-level sound fields.

A new writing group to develop mechanical and acoustical symbols is being appointed.

The need for precision sound pressure level meters, a subject now being considered by an international committee, will be studied by a new exploratory subcommittee authorized at the November 22 meeting of Sectional Committee S1.

The next meeting of Committee S1 will be held during the meetings of the Acoustical Society of America at Ottawa, Canada, May 14-16.

Mechanical Shock and Vibration, S2—

Sponsors: Acoustical Society of America; The American Society of Mechanical Engineers

A new writing group has just been formed to prepare a standard on the techniques of vibration measurement. The group expects to start its work by defining techniques for measuring forces of unbalance developed by assembled rotating machinery. This is intended as a help to the writing group on balancing of machinery, which is preparing an encyclopedic educational document on the subject. Since the new writing group expects to limit its work to the measurement of machinery vibration, an exploratory project is being established to make a survey of vibration measurement standards and to make recommendations to the S2 committee as to the possible need for further action.

The writing group on balancing of machinery is working on a proposed standard covering balancing of rotating machinery. This will include sections on nomenclature and terminology, specifications, description and performance of balancing machines, equipment and systems, and balancing criteria. A number of members of the group are also members of the SAE Balancing Committee which is working to standardize balancing machine components and other hardware associated with balancing systems.

The group is corresponding with several European engineers and engineering organizations in order to consider as many viewpoints as possible before submitting the proposed standard for approval as American Standard.

Committee S2 has nearly completed a proposed American Standard Specification for the Design, Construction, and Operation of Variable Duration Medium-Impact Shock-Testing Machines for Lightweight Equipment, S2.1. Also, a new draft standard covering methods for the Calibration of Shock and Vibration Pickups, S2.2, will be circulated soon for committee action. The new draft incorporates changes made as a result of comments on an earlier draft.

The committee has scheduled its next meeting for May 14-16 at Ottawa, Canada, during the meeting of the Acoustical Society of America.

Bioacoustics, S3—

Sponsor: Acoustical Society of America

Committee S3 reports considerable progress in its work. A proposed American Standard Method for Measurement of Monosyllabic Word Intelligibility, S3.2, is being reviewed by the committee before submittal to the sponsor. Purpose of the standard is to provide criteria by which to determine the intelligibility of one-syllable words that will be used in testing the acuteness of a person's hearing.

A fourth draft of a proposed standard procedure for computing loudness is being completed by the Writing Group on Loudness Computation.

The Working Group on Hearing Aids has been preparing a proposed American Standard as nearly identical to the hearing-aid standard recently adopted by the International Electrotechnical Commission as possible. A final draft is being completed for letter ballot of Committee S3.

The possibility of making the reference level (the zero level) of audiometers more sensitive than the level included in American Standard Z24.5-1951 is being discussed by the Writing Group on Audiometers. Results of laboratory-type surveys made on a large number of people at the Wisconsin State Fair and by the British are being used by the Writing Group as a guide in deciding on this change. The group is considering using the term "hearing threshold level" in place of "hearing loss" to draw attention to the change.

Work is going forward on preparation of a proposed American Standard on a method of calculating speech intelligibility. A writing group of which Dr K. D. Kryter is chairman reports having made some progress. Dr Kryter is with the Operational Applications Laboratory, Air Force Cambridge Research Center, Air Research and Development Command, Bolling Air Force Base, Washington, D. C.

Committee S3 plans to hold its next meeting May 14-16 at Ottawa, Canada, during the meeting of the Acoustical Society of America.

Office Standards, X2—

Sponsor: Vacant

Electric business machines have often been prohibited from areas in which radar sets, television, x-ray apparatus, and other electric and electronic devices have been installed, because of the electrical interference they cause.

Now, maximum permissible levels of interference are being studied by a task group of Committee X2. Although the immediate interest is in dictation equipment, the results will be applicable for all types of electrical business machines.

The Underwriters' Laboratories and the Approvals Laboratory of the Canadian Standards Association have been cooperating in the work. The UL has indicated that if the proposed maximum levels are accepted as American Standard they will become a criterion for acceptance under the UL test methods.

Progress reports on this activity as well as on the work of other

task groups were received by Sectional Committee X2 at its February 10 meeting.

The committee also considered the possibility of dividing itself into five separate, distinct committees in order to deal more effectively with the various aspects of office standards. The scopes suggested are:

1. Office furniture—nomenclature, sizes, materials, and components of office furniture.
2. Paper—terminology, sizes, methods of test, and sampling.
3. Business forms, records, and procedures—terminology, sizes, layout, materials, and tests of business forms and records, and development of standard office procedures.
4. Consumable office supplies — terminology, dimensions, quality, methods of test of items of consumable office supplies; e.g., pencils, erasers, staplers, etc, but not to include paper.
5. Business machines—those features of business machines affecting installation, performance, and operation.

A subcommittee, formed to study this reorganization, is scheduled to meet in March. It will investigate whether there is enough interest in the development of standards in each of the proposed areas and whether a sponsoring organization can be found for each of the projects.

If the reorganization takes place, the new committee concerned with office machines will be requested to review a proposal for an international standards project for office machines. Such a project has been proposed by the Italian national standards organization to the International Organization for Standardization. The American Standards Association has been asked whether the United States would be willing to participate.

In support of the proposal, the Italians cited the increasingly widespread use of mechanical methods in offices, the standardization and automation of office work, the growing international trade in office machines, and the international operations of technical agencies and other enterprises, all of which would make the proposed standardization a matter of current practical value.

by **Cyril Ainsworth**

DINNSA

(Does Industry Need a National Standards Agency?)

THE SECOND SENTENCE of ASA's nicely wrapped-up procedural package found in paragraph 101 of the Procedure states that:

> "An important function of the American Standards Association is the judicial one of determining whether a national consensus has been reached."

This sentence is the basis of all that has been said in the past to the effect that ASA is a quasi judicial agency, that it sits as a court, that it is not concerned with the technical content of standards, and other similar expressions connected with the function of approving standards.

The first word of the sentence is important only to indicate that ASA has other functions, such as promotion of the knowledge of and use of American Standards. The rest of the sentence is very important. Among others, it says two very important things:

1. The sentence tells those planning to present standards for approval as American Standards just what the function of ASA is. The lack of an understanding of this function undoubtedly has prevented the submittal of many standards for approval. It has been visualized by some that ASA has set itself up as a superman kind of technical organization to review the provisions of a standard and say that they are or are not technically sound. Such an understanding could not be further from the truth. The peers of the group submitting the standard determine the technical soundness of the standard. ASA simply reviews the results of these determinations to judge the existence of a consensus on acceptability of the standard.

2. The sentence tells all concerned, including ASA's internal organizations, that the judicial process must be used. ASA headquarters is frequently asked, what is the percentage of vote required for the approval of a standard? The number of votes cast for or against is only part of the evidence that must be considered in the approval of a standard. ASA must determine if any groups were in any way prevented from participating in the development of the standard whether by denial of membership on the technical committee or by denial of the opportunity to vote on the acceptance of the standard. ASA must determine if the reasons given to support negative votes have had adequate consideration by others concerned. All such determinations are involved in the judicial process and are far more potent than the mere counting of votes.

From these two analyses it will be seen that the second sentence of paragraph 101 hits at the heart of ASA operations on the approval of standards as American Standard. A large portion of ASA's $650,000 budget goes to pay for the administration of the many procedural details involved in the judicial function of determining whether a national consensus has been reached. The operation of this function is one of the important reasons why ASA is an essential organization in the national economy.